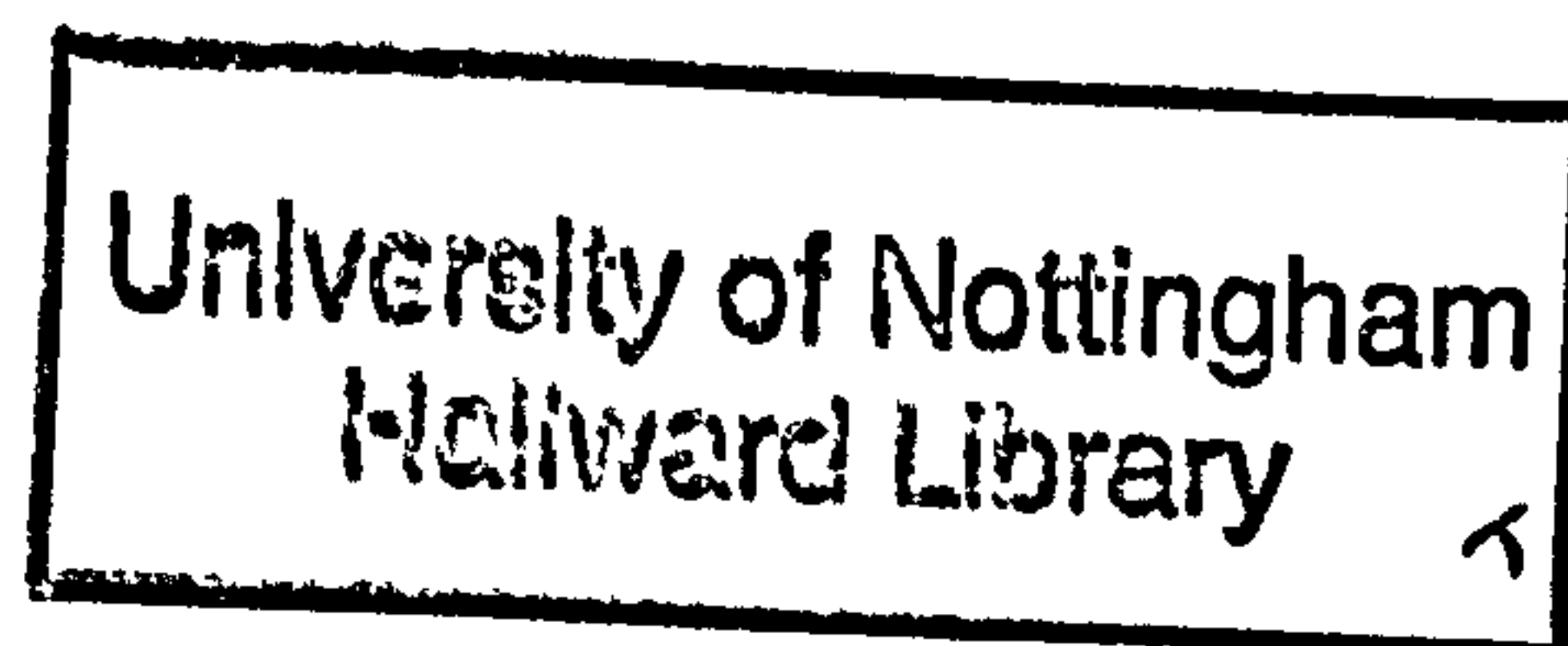


**INTERNATIONAL LAW AND THE PROMOTION OF MARINE PROTECTED AREAS FOR
THE CONSERVATION OF CORAL REEF ECOSYSTEMS**

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ABSTRACT

Coral reefs are one of the most beautiful natural habitats found on the Earth and one of the more productive. As a source of food, or as a basis for tourism, these formations support many local communities, industries and economies. Coral reefs also protect shorelines through dissipating the force of waves and act as a catalyst for the formation of land suitable for human habitation. However, like many other ecosystems, humans are increasingly placing coral reefs under intense pressure from pollution, unsustainable practices, and climate change.

This thesis considers the measures international law is taking to tackle some of these threats to coral reefs through promoting one conservation strategy, namely marine protected areas. The analysis provided is based upon an investigation into developments under a number of global multilateral environmental agreements and, as such, is the first time treaties like the Ramsar Convention on Wetlands, the Convention on Biological Diversity, and the World Heritage Convention, have been considered in detail from this perspective. Ultimately we shall see how a number of initiatives are being pursued under international law which promote such enclave strategies in the marine environment for the conservation of these vital ecosystems.

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The production of this thesis marks the end of a journey which started long before I officially enrolled as a PhD candidate. Since September 2000 when I first meaningfully wondered what laws there were to protect coral reefs whilst on a diving holiday in Egypt, many people have helped me to reach the point I am now at of submitting this study and having the foundations to continue doing something that matters to me.

I am indebted to Michael Bowman, my supervisor at the University of Nottingham, who has supported my research and academic development for approaching half a decade with endless good-humour, patience, advice and wisdom.

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Edward Goodwin, West Bridgford

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LIST OF ABBREVIATIONS

ASEAN	Association of Southeast Asian Nations
BLG	Biodiversity Liaison Group
CAP	Action Plan for the Caribbean Environment Programme
CBD	1992 Convention on Biological Diversity
CITES	1973 Convention on International Trade in Endangered Species
CMS	1979 Convention on the Conservation of Migratory Species of Wild Animals
COP	Conference of the Parties
EEZ	Exclusive Economic Zone
ENSO	El Niño-Southern Oscillation
EPW	Elaborated Programme of Work on Marine and Coastal Biological Diversity to the CBD
FAO	Food and Agriculture Organization of the United Nations
GCRMN	Global Coral Reef Monitoring Network
GEF	Global Environment Facility
IAC	1996 Inter-American Convention for the Protection and Conservation of Sea Turtles
ICJ	International Court of Justice
ICRAN	International Coral Reef Action Network
ICRI	International Coral Reef Initiative
ICZM	Integrated Coastal Zone Management
IGO	Inter-Governmental Organization
IMO	International Maritime Organisation
IOSEA	2000 MOU on the Conservation and Management of Marine Turtles and their Habitats of the Indian Ocean and South-East Asia
IPCC	Intergovernmental Panel on Climate Change
IUCN	The World Conservation Union

LOSC	1982 United Nations Convention on the Law of the Sea
MAB	1971 UNESCO Man and the Biosphere Programme
MEA	Multilateral Environmental Agreement
MOU	Memorandum of Understanding (sometimes MoU)
MPA	Marine Protected Area
NOAA	National Oceanic and Atmospheric Administration
PSSA	Particularly Sensitive Sea Area
ROPME	Regional Organization for the Protection of the Marine Environment, Kuwait
RSPB	The Royal Society for the Protection of Birds
SBSTTA	Subsidiary Body on Scientific, Technical and Technological Advice to the CBD
SPAW	1990 Protocol Concerning Specially Protected Areas and Wildlife to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region
SPREP	South Pacific Regional Environment Programme
STAC	Scientific and Technical Advisory Committee to the SPAW
STRP	Scientific and Technical Review Panel to Ramsar
UNCED	1992 United Nations Conference on Environment and Development
UNCLOS	United Nations Conference on the Law of the Sea
UNEP	The United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WCMC	The World Conservation Monitoring Centre
WCPA	World Commission on Protected Areas
WHC	1972 Convention Concerning the Protection of the World Cultural and Natural Heritage
WWF	World Wide Fund for Nature

PART I

PRELIMINARIES

CHAPTER ONE – INTRODUCTION

1. CORAL REEFS AND MARINE PROTECTED AREAS

It has recently been estimated that coral reefs occupy 284,300 sq. km. of the planet's surface.¹ This is less than 0.1 per cent of the total surface area.² Yet in practical and economic terms, the contribution of coral reefs is disproportionately large. For many human populations, coral reefs have for millennia been the major source of protein for their diets. In some cases, coral rubble and sand has helped to raise land above sea level, enabling human habitation. Reefs can also dissipate the force of waves, thus protecting shores and communities. Increasingly, coral reefs as a natural wonder attract tourists from around the globe. Finally, to those in need, coral reefs may bring relief from medical conditions, as scientists explore new organic chemicals present in the coral reef ecosystem.³ Indeed, a conservative estimate produced in 1997⁴ concluded that coral reefs contributed the equivalent of US\$375 billion p.a., as part of a global total ecosystem value of US\$33,268 billion p.a.⁵ Therefore, based on these estimates, coral reefs contributed 1.13 per cent of the annual total.

¹ M.D. Spalding *et. al.*, *World Atlas of Coral Reefs* (University of California) (2001) at 17.

² UNEP-WCWC Press Release, *New Atlas Maps the World's Fast Disappearing Coral Reefs*, September 11, 2001.

³ On these benefits see Spalding, *supra* n. 1 at 9.

⁴ R. Costanza *et. al.*, "The Value of the World's Ecosystem Services and Natural Capital" (1997) 387 *Nature* 253 at 256.

⁵ This figure reflects contributions toward disturbance regulation, waste treatment, biological control, habitat/refugia, food production, raw materials, culture, and recreation. Costanza, *ibid* at 256.

Complex natural processes around coral reefs, involving predation, climate and erosion, govern the ecosystem. Over time this has meant that corals, the reefs they build and the entire ecosystem have ebbed and flowed in abundance and geographic distribution.⁶ But natural processes are increasingly being disturbed by anthropogenic interference and pressure. Uncontrolled fishing has directly and indirectly harmed coral reef ecosystems.⁷ Growing populations (of both permanent residents and transients like tourists), together with the attendant development of urban areas and tourist accommodation, have increased the scale of pollution and sedimentation with which coral reefs must contend.⁸ On a wider scale it is estimated that rising water temperatures destroyed 16 per cent of coral reefs worldwide in 1998⁹ and it is predicted that anthropogenically-fuelled climate change will cause the greatest mortality of corals in the coming years through increased coral bleaching, particularly where coral reef ecosystems are subject to other anthropogenic stresses.¹⁰ The vast economic benefits of tourism come at an additional price as some physical damage to reefs is caused by divers and boats alike, while the fish stocks are utilised further to feed visitors and produce curios.¹¹

⁶ N.E. Chadwick-Furman, "Reef Coral Diversity and Global Change" (1996) 2 *Global Change Bio.* 559.

⁷ Direct impacts include dynamite fishing whilst indirect impacts relate to the composition and size of catch. See S. Jennings and N.V.C. Polunin, "Impacts of Fishing on Tropical Reef Ecosystems" (1996) 25(1) *Ambio* 44.

⁸ C. Wilkinson, "Status of coral reefs of the world: summary of threats and remedial action" in I. Côté and J. Reynolds, *Coral Reef Conservation* (CUP) (2006) at 23-25

⁹ C. Wilkinson, *The Status of Coral Reefs of the World* (GCRMN) (2000) at 1.

¹⁰ C. Wilkinson, *Executive Summary - The Status of Coral Reefs of the World* (GCRMN) (2002) at 7.

¹¹ G. Jobbins, "Tourism and coral-reef-based conservation: can they co-exist" in I. Côté and J. Reynolds, *Coral Reef Conservation* (CUP) (2006) at 239-241.

Much scientific energy and charity-based effort has now been put into understanding coral reefs and resolving these problems. However, as society comes to better understand these ecosystems and their significance, so it becomes more apparent how urgent it is to take steps to conserve them, particularly given that, as Spalding claims:

One of the saddest facts about the demise of reefs is that it is utterly nonsensical. Protecting and managing reefs is not just for the good of the fishes, in every case it also leads to economic and social benefits for local communities.¹²

Legally, steps are being taken at the international level to remedy the damage man is doing; the United Nations Convention on Climate Change and the Kyoto Protocol are attempts to combat the greatest threat which is that posed by climate change. However, outside of steps to tackle climate change, one of the most widespread legal mechanisms for conserving coral reefs and their ecosystems is the designation of an area as a marine protected area (“MPA”).

MPAs facilitate the control of fishing and harvesting of resources around coral reefs as well as recreation within an area. Occasionally, where the boundaries extend to include adjacent land, MPAs can also influence development. Yet many MPAs are viewed as merely existing on paper with little positive impact on the reefs they are intended to conserve.¹³ One initiative to improve the effectiveness of MPAs is that of the International Coral Reef Action Network (“ICRAN”). Through the support of such bodies as the United Nations Environment Programme (“UNEP”), ICRAN intends to

¹² *Supra*. n. 2.

¹³ Spalding, *supra* n. 1 at 72.

establish a number of MPAs as “centres of excellence” to act as beacons in terms of reef management and to reduce the number of such paper parks.¹⁴

In the light of this drive to establish “centres of excellence” and promote conservation of coral reefs, it seems pertinent as an international lawyer to ask how (if at all) is international law promoting MPA strategies for the conservation of coral reef ecosystems?

2. METHODOLOGY

This study will adopt an analytical approach to answering the central question of how, if at all, international law promotes MPA strategies for the conservation of coral reef ecosystems. That central question requires a number of steps to be taken.

Part II begins in Chapter 2 by introducing and exploring corals, reef building and the complex ecosystem at the heart of this study. By so doing it is possible to clarify what this thesis means when talking about coral reef ecosystems. Further, an understanding of the factors limiting coral development helps to explain coral reef distribution, whilst understanding the forces of natural predation and competition emphasises the complexity of the coral reef ecosystem itself.

Chapter 3 goes on to explore the benefits of coral reefs and therefore helps to explain this study’s reasons for wishing to see that corals continue to flourish on earth. The natural progression is then to identify the forces which are currently threatening the continued prospering of coral reef ecosystems.

¹⁴ UNEP Press Release, *East Africa Part of Global Initiative to Save Coral Reefs*, 19 March 2001.

A number of strategies are being pursued to help conserve coral reef ecosystems. Chapter 4 touches on many of these, but focuses upon one approach in particular, namely MPAs. Amongst other things this study will define MPAs and consider the efficacy of such conservation strategies for coral reefs in the light of climate change. Finally, the thesis will analyse the consensus of opinion on best practices for the effective and efficient operation of an MPA.

Part II will therefore have defined key terms in the study's central question, leaving the rest of the study to explore whether international law does promote MPAs and the conservation of coral reef ecosystems, hopefully in an integrated manner. Part III therefore contains six chapters which critically analyse the pertinent international law relating to MPAs and coral reefs ecosystem. Five of these chapters consider the:

- 1982 United Nations Convention on the Law of the Sea and Regional Seas Initiatives;¹⁵
- 1992 Convention on Biological Diversity;¹⁶
- 1971 Convention on Wetlands of International Importance, Especially as Waterfowl Habitat;¹⁷
- 1972 UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage;¹⁸ and

¹⁵ 21 *ILM* 1261.

¹⁶ 31 *ILM* 818.

¹⁷ 11 *ILM* 963.

¹⁸ 11 *ILM* 1358.

- 1979 Convention on the Conservation of Migratory Species of Wild Animals.¹⁹

Areas of strength and weakness will be highlighted enabling conclusions to be drawn as to the future direction the law could follow. Such conclusions are of value given that, whilst much effort is being spent by the international community on developing the best management regimes within MPAs, less attention is being paid to the legal framework within which such MPAs operate.

¹⁹ 19 *ILM* 15.

PART II

CORAL REEF ECOSYSTEMS & THEIR PROTECTION

CHAPTER TWO – MARINE BIOLOGY AND CORAL REEFS

1. CORALS – CLASSIFICATION AND BIOLOGY

Corals, as a biological order, are found throughout the Earth's oceans from the tropics to the polar regions. Belonging to the same phylum as jellyfish (Cnidaria) and the same class as anemones (Anthozoa), there is significant variety amongst coral species. Since this thesis is only concerned with certain species of corals, it is important to explore some of these differences and distinguishing features so that the boundaries of this study can be highlighted.

As stated, corals can be found throughout the oceans both at depth and in the shallows. It is important, however, to distinguish between cold water and warm water corals, since it is only the latter with which this study is concerned. Both cold water and warm water corals are capable of depositing calcium carbonate which by increment contributes either entirely or predominantly to the formation of carbonate skeletons and reef structures. Significantly, however, there are a number of differences between the two as listed by Corcoran and Hain.¹ For example, there are only six species of cold water corals compared to 80 warm water corals and calcification rates are much slower for cold water corals.²

The latter point relates to another key difference. As this chapter will move on to discuss, the fixing of calcium carbonate from marine water requires the coral to produce large amounts of energy to drive the process. Cold water corals derive this

¹ E. Corcoran and S. Hain, "Cold-water coral reefs: status and conservation" in I. Côté and J. Reynolds (eds), *Coral Reef Conservation* (CUP) (2006) 115 at 118-119.

² *Ibid.*

energy from capturing and consuming zooplankton and other dissolved organic matter carried on the ocean currents.³ Tropical waters, however, are more barren in terms of readily available food for the corals to capture. Consequently, these warm water corals have developed a symbiotic relationship with tiny plants called zooxanthellae which live in the coral's cells. The noted shortfall of food is then compensated for by the transfer of energy rich organic compounds (e.g. sugars, carbohydrates, amino acids) from the zooxanthellae, having been first produced by the zooxanthellae through photosynthesis.⁴

Marine biologists are therefore able to divide corals between those which are host to zooxanthellae and those which are not, referring to the former as hermatypic corals and to the latter as ahermatypic. Cold water corals are all ahermatypic whilst warm water corals are almost all hermatypic.⁵

This study is limited to considering whether international law is promoting the conservation of warm water coral reef ecosystems through marine protected area strategies. This means that cold water corals, the reefs they form and the ecosystem existing around these structures are entirely and deliberately excluded from this thesis. The justifications for this relate to the readily accessible economic and life-support functions of the ecosystems which exist around reef structures formed by warm water corals in what would otherwise be barren waters. This is not to say that cold water reefs

³ A. Freiwald *et al*, *Cold Water Coral Reefs: Out of Sight – No Longer Out of Mind* (UNEP-WCMC Biodiversity Series) (2004) at 18.

⁴ L. Muscatine and E. Cernichiar, "Assimilation of photosynthetic products of zooxanthellae by a reef coral" (1969) 137 *Biol. Bull.* 506.

⁵ Corcoran, *supra* n. 1 at 118.

do not encourage abundance,⁶ nor that man cannot exploit their bounty.⁷ However, the catalysing effect of cold water coral reefs is less apparent and significant than for warm water corals (which are more akin to an oasis in a desert),⁸ nor the exploitation of the resources so varied and widely accessible, as will be seen in Chapter 3. This situation becomes even more significant when it is realised that the populations who live in close proximity to tropical reef systems and rely on these economic and life support functions are predominantly residing in poorer developing countries. The limited focus of this study therefore seems merited, and all references hereafter to corals, coral reefs and coral reef ecosystems will therefore be restricted to those found in tropical shallow warm waters.

2. CALCIFICATION AND REEF DISTRIBUTION

Such a restriction on the ambit of this thesis happens to coincide with common perceptions of coral reefs, namely a colourful and diverse shallow marine habitat in tropical waters and encompassing both the physical structure itself and the animals dependent upon, and found in close proximity to, that reef structure. This study, however, limits the term ‘coral reef’ to simply the reef structure built predominantly by warm water corals and therefore accords with Spalding’s definition of a coral reef as:

⁶ Such reef ecosystems may increase biodiversity by 3 times compared to the surrounding sea-bed; Ø. Thiem *et al.*, “Food supply mechanisms for cold-water coral along a continental shelf edge” (2006) 60 (3-4) *Journal of Marine Systems* 207 at 208.

⁷ Fish can be caught using long-line, gill nets and trawling, although the latter causes significant damage, *ibid.*

⁸ Warm water coral reefs make tropical waters 100 times more productive, *infra* at 15.

... a physical structure which has been built up, and continues to grow, over decadal time scales, as a result of the accumulation of calcium carbonate laid down by hermatypic corals and other organisms.⁹

The most important organisms which lay down calcium carbonate to form such coral reefs are coralline algae and the corals themselves. However, whilst coralline algae play an important role in ‘cementing’ the reef structure together, corals are the principal biological medium through which calcification occurs on reefs.¹⁰ Corals, using the energy supplied through their symbiotic relationship with zooxanthellae, secrete calcium carbonate by using the calcium and carbon dioxide held in solution in the ocean.¹¹ It has been estimated that in so doing corals remove about 700 billion kilograms of carbon per annum.¹²

The calcium carbonate skeletons of corals grow at different rates depending upon species, the continued presence of zooxanthellae, age and location. For example, branching corals grow relatively quickly (15 cm per annum) when compared with others types such as brain corals.¹³ Such growth is balanced by erosion – both in the form of bio-erosion which is the action of various organisms degrading the calcareous

⁹ M. D. Spalding *et. al.*, *World Atlas of Coral Reefs* (University of California) (2001), at 16. Note that the term ‘reef’ has also been used in a maritime context to refer to a shallow ridge of rocks. Such formations are not the subject of this study.

¹⁰ *Ibid* at 15.

¹¹ C. Langdon, “Rise in Atmospheric CO₂ Threatens Coral Reefs... An experiment Carried out at Biosphere 2” (1998) available at www.earthmatters.com.

¹² J. W. Nybakken, *Marine Biology* (Benjamin Cummings) (2001, 5th Ed.), at 370.

¹³ Spalding, *supra* n.9, at 15. One 70 year old brain coral specimen from Bermuda was estimated to have grown at a rate of 2mm per year – A. Cohen and M. McCartney, *Seasonally Resolved Records of Surface Ocean Conditions in Brain Coral from Bermuda* (1999) in *Papers on Atlantic Climate Variability, Atlantic Climate Change Program, Office of Global Programs, NOAA* available at www.aoml.noaa.gov/phod/acvp/cohen.htm.

substrates (e.g. organisms that burrow into the coral reef) and through other forces of nature (e.g. wave action, storm damage).¹⁴ The rubble and sand produced by such erosion either falls into fissures in the coral reef (where they may be cemented into the structure by calcium carbonate produced by algae), or are washed in shore to form beaches and other important coastal habitats. Consequently, the net growth or retreat of coral reefs is very slow and takes place over geological time scales.¹⁵

The coral reefs which are the subject of this thesis are not distributed evenly or found throughout the oceans (see Diagram 1). They predominate in coastal tropical areas i.e. between latitudes 25°S and 25°N and in two main swathes: (a) the Caribbean; and (b) the Western Pacific and Indian Ocean. This section must therefore finally consider the six factors which limit reef building by warm water corals and therefore determine the distribution patterns of coral reefs, namely:

- i. temperature;
- ii. light;
- iii. depth;
- iv. sedimentation;
- v. salinity; and
- vi. exposure to air.

¹⁴ Nybakken, *supra* n. 12 at 411.

¹⁵ Spalding, *supra* n. 9, at 15.

Diagram 1 : The Distribution of Coral Reefs Around the World¹⁶



Key: coral reefs are indicated as black areas.

¹⁶ This Diagram has been adapted from a map produced by UNEP-WCMC (1997) and available at www.wcmc.org.uk.

Whilst a few corals can survive at lower temperatures, reef building in shallow tropical marine areas only occurs where the temperature of the water ranges from a minimum of 18°C to a maximum of 30°C.¹⁷ This limiting factor explains why the coral reefs this thesis is concerned with lie within the 20°C isotherm (i.e. within the boundaries of the tropical bio-geographical zone). It also explains, *inter alia*, why shallow reefs are not found on the west coasts of Africa and Central/Southern America, as these coastal areas are cooled too much by the action of northerly currents and up-welling of cold waters from deeper climes. Further, for reef building to flourish, a degree of stability with respect to water temperatures is also required. Tropical sea temperatures provide such stability.¹⁸

The availability of light is of paramount importance to the development of coral reefs. Whilst corals can survive for short periods of time without zooxanthellae, it is this symbiotic relationship that is “*the chief source of energy for the energetically expensive process of calcification*”.¹⁹ Insufficient light has the effect of reducing energy supply from the zooxanthellae and accordingly inhibits the ability of corals to secrete calcium carbonate and thus build reefs. Given that light decreases with depth, reef formation is correspondingly limited. Reef building undertaken by warm water corals therefore flourishes in water depths of less than 25 metres,²⁰ and ceases altogether beyond 100

¹⁷ O. Hoegh-Guldberg, “Climate change, coral bleaching and the future of the world’s coral reefs” (1999) 50 *Marine Freshwater Research* 839 at 841.

¹⁸ *Ibid.*

¹⁹ Hoegh-Guldberg, *supra* n.17 at 859.

²⁰ Nybakken, *supra* n. 12 at 372.

metres.²¹ Reduction in the intensity of light by sedimentation in the water (turbidity) will logically bring the limits of such reef building closer to the surface.

Sedimentation can also prevent reef formation in two other ways. First, coral reproduction through the production and release of coral larvae depends upon the larvae being able to settle upon solid substrata in order to fix themselves to a firm foundation – something which will not be present if sedimentation covers the sea floor with a fine mud.²² Further, once a colony has been established, subsequent sedimentation may cause corals to become smothered. Corals have a natural mechanism for removing small amounts of sediment, as mucus can be secreted to carry it away. This mechanism cannot, however, cope with large quantities of sediment which clogs the corals feeding structures.²³

Salinity is another major limiting factor for the development of coral reefs. Being marine animals, corals require salinity levels which do not differ far from the norm.²⁴ It is for this reason that reefs do not form where rivers discharge fresh water into the ocean.²⁵ Consequently, reefs do not form on the coast of South America where the Orinoco and Amazon flow into the sea, or on the West Coast of Africa where the Congo and Niger discharge freshwater and sediments. On a smaller scale, small breaks in fringing coral reefs can be observed in the tropics where streams or smaller rivers flow into the sea and thus lower salinity levels.

²¹ T. Austin *et al.*, *The Exploitation of Coral Reefs* (1996) (Field Studies Council) at 1.

²² Spalding, *supra* n. 9 at 22.

²³ H. Schuhmacher, “Ability in Fungiid Corals to Overcome Sedimentation” (1977) *Proceedings, Third International Coral Reef Symposium* 503.

²⁴ D. W. Souter and O. Linden, “The Health and Future of Coral Reef Systems” [2000] 43 *Ocean & Coastal Management* 657 at 657.

²⁵ And large quantities of sediment with the attendant problems noted before.

The last limit to coral reef development is that of exposure to the air, which is in turn linked to the level of the lowest tide. That said, corals can withstand short periods of time (1-2 hours) exposed to the air with the mucus mechanism providing protection at such times to prevent drying and therefore dying.²⁶

3. CORAL REEF ECOSYSTEMS – A MARINE OASIS

Life on earth does not exist in isolation – species interact with each other and their physical environment in order to survive. The term “ecosystem” is used to describe the interactions between biotic (living) and abiotic (non-living) components.²⁷ The term coral reef ecosystem in this study is therefore defined by: (a) the community of organisms inter-acting with and (directly or indirectly) dependent upon each other and the coral reef environment; and (b) the coral reef in which they live. In this way, threats to coral reef ecosystems clearly include threats to the reef itself as well as the corals and other organisms.

Where conditions are suitable, coral reefs form (quite literally) the foundations for what is one of the most diverse ecosystems on the planet. However, the abundance of life on coral reefs is staggering when consideration is given to the poor nutrient levels of tropical oceans in general.²⁸ The gross primary production of nutrients in open tropical

²⁶ C. Wild *et al*, “Coral mucus functions as an energy carrier and particle trap in the reef ecosystem” (2004) 428 *Nature* 66 at 66. For an example of mortality caused by low tides see Y. Loya, “Recolonization of Red Sea Corals Affected by Natural Catastrophes and Man-Made Perturbations”, (1976) 57 *Ecology* 278 at 279.

²⁷ The essence of such interactions lie at the heart of some significant definitions of an ecosystem, for example, the Convention on Biological Diversity defines an ecosystem as “*a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.*” 1992 Convention on Biological Diversity 31 *ILM* (1992), 818, Article 2.

²⁸ Life on earth depends almost entirely upon inorganic compounds being converted into energy rich organic compounds, predominantly through the process of photosynthesis by plants and animals. The

oceans is estimated as between 18-50 g C/m²/yr.²⁹ In contrast, coral reefs are one of the most productive of all marine ecosystems with gross primary productivity estimated at between 1 – 5 kg C/m²/yr.³⁰ It is this productivity which lies at the very heart of tropical marine ecosystems in general and the survival of many local people.³¹

It is an often repeated cliché that coral reef ecosystems are the rainforest of the sea. Statistics given by Spalding *et al* bear out this comparison between the two.³² They observe that the estimated 4,000 species of coral reef fish world-wide (¼ of marine fish species) is comparable to the variety of birds found in rainforests, and that in a 5 metre² area of the Caribbean, surveyors identified 534 species with additional unidentified species also being recorded. They estimated that to date only 10% (approx. 93,000) of the ecosystem's species have been identified by scientists.³³

Of course, diversity within coral reef ecosystems varies throughout the oceans.³⁴ Austin observes that records of coral diversity show a pattern of concentration centred on South-East Asia (particularly the triangle bounded by Indonesia, the Philippines and Northern Australia), in contrast to much lower levels of diversity in the Atlantic and

energy rich organic material which is not used by the plants and animals responsible for this primary production, is released and made available to other organisms or transferred to other organisms when directly consumed. Such gross primary productivity (i.e. before consumption by the primary producers) is measured in terms of grams of carbon produced per square metre per year (C/m²/yr). See further Nybakken, *supra* n. 12 at 55.

²⁹ Nybakken, *supra* n. 12 at 385.

³⁰ T. Austin *et al*, *The Exploitation of Coral Reefs*, (Field Studies Council) (1996) at 3. Nybakken uses a slightly more conservative estimate of between 1.5 – 5 kg C/m²/yr, *ibid*.

³¹ Hoegh-Guldberg, *supra* n. 18 at 839.

³² Spalding, *supra* n. 9 at 27.

³³ *Ibid*.

³⁴ Here, diversity refers to the variability among the living organisms found within the coral reef ecosystem.

Caribbean.³⁵ The reason for the pattern is principally linked to tectonic and climatic history as oceans became isolated by the movement of continents and glaciations affected some areas more than others.³⁶

With such an abundance of life found on coral reefs, many species have had to adapt to living within small niches, both in physical terms and through specialised diets. Further, the interactions between the resident species are highly complex and a few of these relationships will be explored in greater detail in the following section so as to inform this study's later discussion of human impacts on coral reef ecosystems. Ultimately, it is important to give an account of natural competition, predation and grazing (particularly upon corals and algae) as it is these interactions which often affect whether the coral reef increases or decreases in size.

4. INTERACTION, PREDATION AND GRAZING UPON CORALS AND ALGAE

Many complex interactions exist within the coral reef ecosystem, as species have adapted to living in close proximity to each other and within the varied niches on offer over the coral reef. A few examples can be given to illustrate this.

Corals are in constant competition with each other to dominate space on the reef and receive light. Some competitive mechanisms have already been mentioned in passing. For example, it was noted that some corals grow faster than others, such as the branching corals. Such speed of growth helps these species to outrun others into the prime positions. That said, the continued existence of the slower growing massive corals, indicates that these species have developed responses enabling them to compete

³⁵ Austin, *supra* n. 21 at 3.

³⁶ For an in-depth discussion see N. Chadwick-Furman, "Reef coral diversity and global change" (1996) 2 *Global Change Biology* 559.

with their faster growing relatives. Indeed, one such method is the extension of filaments from the gastro vascular cavities of the slower growing corals which are capable of killing tissues of competing coral species in close proximity.³⁷ These competitive interactions are made more complex by the fact that predation, environmental and geographical factors can also influence the outcome of competition between coral species. This can be understood most clearly by reference to algae.

Corals are in competition with other invertebrates such as sponges and, in particular, algae. Algae are of particular importance to the coral reef ecosystem. Red coralline algae secrete calcium carbonate and, as they are spread out over the reef in a thin layer, cement together various pieces of calcium carbonate into the coral reef structure.³⁸ In so doing, the entire reef is strengthened and reinforced.

However, if left unchecked, algae can advance over much of a reef causing damage to the corals. This state of affairs is primarily avoided through intensive grazing on the algae by fish and sea urchins who, it is estimated, jointly remove in excess of half of the algal cover on a reef.³⁹ The impact of removing these species can be disastrous for the health of a coral reef, and when this happens (as will be explored in more detail in the following chapter) serves to highlight the close relationships between the biotic components of the coral reef ecosystem.

5. SUMMARY

This chapter has introduced corals, reef building and the complex ecosystem at the heart of this study. By so doing it has been possible to clarify the scope of this thesis.

³⁷ Nybakken, *supra* n. 12 at 391-392.

³⁸ Spalding, *supra* n. 9 at 15.

³⁹ Nybakken, *supra* n. 12 at 397.

The definition of coral has been limited to warm water corals, and coral reefs to the structure formed by the laying down of calcium carbonate by such corals, coralline algae and other organisms.

This particular focus flows from the importance of warm water coral reefs for many people in developing countries. Tropical coral reefs are the catalyst and support structure which brings life to waters which would otherwise be barren. Significantly for local populations, they also offer a readily accessible source of food and other economic benefits to help sustain such communities. The shallow depths at which tropical reefs are found put them in reach of divers, tourists and local fishermen who may only have limited resources. Cold water corals lie at depths which prevent the stimulation of the full range of economic opportunities (such as tourism) or limit access to marine resources to those with the equipment to operate deep underwater. Further examples of the benefits of warm water coral reefs, highlighting their importance to local communities, will also be given in the following chapter.

Finally this study has sought to give some idea about the complexity of the coral reef ecosystem and the intricate relationships between the components that go to make it up. Of course, such a careful balance leaves coral reef ecosystems vulnerable to shaping by anthropogenic factors and these will also be discussed more fully in the following chapter.

CHAPTER THREE – FOR RICHER, FOR POORER

1. HOW DO CORAL REEF ECOSYSTEMS HELP US?

For many millennia coral reefs and their ecosystems have been supporting human life in parts of the world, both in physical, economic and nutritional terms. In more recent times, scientific research and the growth of the tourist industry have increasingly been based upon these habitats. Each will now be looked at in more detail.

1.1 FISHERIES AND FOOD PRODUCTION

Coral reef ecosystems have provided crucial protein to generations of humans dating back at least 30,000 years.¹ In more recent times, it has been estimated that fish catch from such habitats is about 6 million metric tonnes.² On top of this, an estimated 9 million metric tonnes of shellfish and other molluscs are taken per annum in and around coral reef ecosystems.³ These commercial catch figures are probably on the conservative side since they do not reflect the additional harvesting of resources through subsistence fishing by local fishers.

Whilst the figures above are based upon commercial catch, such activities should not be thought of as being of the same character or scale as the European fishing industry. Fishing is primarily undertaken by local people, using traditional methods i.e. artisanal,

¹ M. D. Spalding *et. al.*, *World Atlas of Coral Reefs* (University of California) (2001) at 47.

² T. Austin *et al*, *The Exploitation of Coral Reefs* (Field Studies Council) (1996) at 7.

³ D. W. Souter and O. Linden, “The Health and Future of Coral Reef Systems”, (2000) 43 *Ocean & Coastal Management* 657 at 659. See also the estimate prepared by R. Costanza *et. al.*, “The Value of the World’s Ecosystem Services and Natural Capital” (1997) 387 *Nature* 253.

to support local needs.⁴ Catch is often multi-species (e.g. groupers, jacks, snappers, puffer fish), partly because of the diversity of life found in coral reef ecosystems, but also because pressures from large local populations mean that sources of protein must be maximised.⁵ Where population pressure is not so great, more selective fisheries exist employing fewer fishing methods.⁶ Of course, in some instances single species can support dedicated industries as is the case with spiny lobsters and sea cucumbers.

Coral reef ecosystems are not, however, harvested purely as a food source. Catching fish, removing pieces of live coral rock and harvesting other ecosystem inhabitants for the aquarium trade is far more lucrative. In 2000, Spalding claimed that 1 kg of live fish caught in one island country was valued at US\$500 to the aquarium trade whilst the same kilo would have been worth only US\$6 as food.⁷ Properly managed, such trade can be highly lucrative and sustainable.

If the revenue that can be produced from trade in other reef products such as pearls and coral-based jewellery is also factored in,⁸ it is clear that coral reef ecosystems are extremely beneficial to man, and not just as a food source.

⁴ M. Watson and R. F. G. Ormond, "Effect of an Artisanal Fishery on the Fish and Urchin Populations of a Kenyan Coral Reef" (1994) 109 *Mar. Ecol. Prog. Ser.* 115

⁵ C. Wilkinson, "Status of coral reefs of the world: summary of threats and remedial action" in I. Côté and J. Reynolds (eds), *Coral Reef Conservation* (2006) (CUP) at 22-23.

⁶ Austin, *supra* n. 2 at 7-8.

⁷ Spalding, *supra* n. 1 at 50-51.

⁸ A. Vincent, "Live food and non-food fisheries on coral reefs" in I. Côté and J. Reynolds (eds), *Coral Reef Conservation* (CUP) (2006) 183 at 196-197.

1.2 GENETIC RESOURCES AND BIO-PROSPECTING

Natural ecosystems are a valuable resource to medical and scientific research. Given that knowledge on coral reef ecosystems only began to develop in the latter half of the last century, the full potential of these ecosystems to science and medicine is only now beginning to be recognised. As Spalding notes,⁹ many reef inhabitants have had to develop diverse forms of defence within the complexities of the ecosystem against a broad range of predators, and this has driven the development of bio-chemical compounds in numerous and potentially valuable directions. Of particular interest to the scientific community are possible alternatives to established and now weaker antibiotics, which can be derived from toxins found in coral reef inhabitants such as puffer fish.¹⁰ In a more directly practical way, the skeletons of corals have also been used successfully as bone grafts.¹¹

Such bio-prospecting is controversial. Whilst a need to encourage research and development exists, a balance is called for to ensure source countries receive a fair return from exploitation of their natural resources. This is especially the case where research and development is conducted by drug companies based in other states.¹² Further, it is difficult to rear these useful marine organisms in captivity¹³ so pressures on naturally occurring stocks to supply potentially large demands raise concerns over sustainability.

⁹ Spalding, *supra* n. 1 at 53-54.

¹⁰ *Ibid.*

¹¹ Souter and Linden, *supra* n. 3 at 660.

¹² For a wider ranging discussion of such issues see P. Birnie and A. Boyle, *International Law and the Environment* (2002, 2nd Ed.) (OUP) 732-739.

¹³ J. W. Nybakken, *Marine Biology* (Benjamin Cummings) (2001, 5th Ed.) at 487.

1.3 COASTAL PROTECTION AND LAND FORMATION

Common perceptions of tropical coasts invariably revolve around beaches of pure white sand, with surf breaking in the middle distance. In fact, such views reflect the critical role that coral reefs play in protecting many islands from the force of waves as well as their role in land formation.

Corals thrive in moderate wave action and the consequent barrier which forms as the corals and other calcifying organisms lay down calcium carbonate, shields the land by breaking the power and action of the waves.¹⁴ The cycle of calcification by algae and the breaking down of coral into small particles by reef fish is the main source of the sand which washes into the calm waters behind a reef, eventually forming beaches.¹⁵

Even in the wake of storms where break-up of the reef structure can occur, the rubble and sand created is often forced up onto the land. This build-up creates new land, which over time becomes the sub-strata upon which vegetation grows and humans can survive. This process of land formation is the very foundation of many small island states.¹⁶

1.4 TOURISM

According to the World Tourism Organisation, 694 million people travelled to a foreign country in 2003, spending more than US\$ 514 billion.¹⁷ More recent figures confirm

¹⁴ UNEP/WCMC, *In the front line: shoreline protection and other ecosystem services from mangroves and coral reefs* (UNEP-WCMC) (2006) at 14.

¹⁵ *Ibid* at 15.

¹⁶ Spalding, *supra* n. 1 at 55.

¹⁷ World Tourism Organisation, "International Tourism Receipts" (2004) 2(2) *World tourism Barometer* 2 at 2.

the position of tourism as the world's number one export earner.¹⁸ One area of growth in tourism has come from the increasing numbers of people participating in snorkelling and scuba diving.

The number of people diving each year to view coral reefs is particularly difficult to estimate. Figures based upon the number of registered divers according to certification agencies such as the British Sub-Aqua Club and the Professional Association of Diving Instructors, merely give an indication of the considerable and growing interest in the sport.¹⁹ In addition, many dives go unrecorded as dive operators offer one off 'Try-Dives' which help to introduce people to the sport. What can be observed is that reef based tourism, as a result of the growth in interest in diving and the increased affordability of international flights, is expanding and extremely lucrative. In a 10 year period from 1985 – 1995, the number of people visiting the Great Barrier Reef in Australia grew from 1.1 million to over 10 million, whilst the value of this tourism to the same area was estimated at US\$700 million in 1997.²⁰ Closer to home, capacity for tourists in the Sinai Peninsula, Egypt, grew from 1,030 beds in 1988, to over 15,000 by 1998. The Egyptian Government has set a ceiling to this capacity at 160,000 beds and this is expected to be reached by 2017.²¹ Such expansion is linked to the reefs that

¹⁸ www.uneptie.org/pc/tourism/sust-tourism/economic.htm.

¹⁹ Spalding estimates that there are 15 million registered recreational divers although there is no indication whether this includes divers who hold more than one level of qualification e.g. a Professional Association of Diving Instructors 'Open Water' diver who has taken further training and gained certification as an 'Advanced Open Water' diver. Spalding, *supra* n. 1 at 54.

²⁰ *Ibid* at 55.

²¹ M. P. Pearson and A. I. Shehata, "Protectorates Management for Conservation and Development in the Arab Republic of Egypt" (1998) 8(2) *Parks* 29 at 31.

fringe the shores of the Red Sea and Gulf of Aqaba, attracting many divers from around the World and in particular from Europe.²²

Clearly, coral reef ecosystems form a strong basis for tourist developments whether as a destination for divers, or simply for travellers seeking sandy beaches and warm waters.

2. HUMAN IMPACTS

There are a number of different types of human impact upon coral reef ecosystems. These relate to pollution, sedimentation, fishing, climate change and non-fishing related physical damage. Understanding the nature of these threats helps to focus conservation strategies to tackle each problem and the remainder of this section therefore provides more detail on these human impacts.

2.1 POLLUTION AND SEDIMENTATION

Increased pollution and sedimentation attributable to human activity have four negative consequences for corals and therefore reef building and the ecosystem as a whole. Increased pollution and sedimentation may:

- i. impair photosynthesis;
- ii. tip the careful competitive balance within the ecosystem against corals;
- iii. smother coral polyps; and/or
- iv. harm the reproductive system of corals.

²² The revenue from scuba diving could be increased, as one study has found a willingness on the part of divers to pay an entrance fee to marine parks, with willingness increasing if such payments are received and managed by NGOs. See T. Arin and R. A. Kramer, "Divers' Willingness to Pay to Visit Marine Sanctuaries: an Exploratory Study" (2002) 45 *Ocean & Coastal Management* 171.

First, in relation to (i), Chapter 2 of this thesis made reference to the significant role of photosynthesis by the resident zooxanthellae for satisfying the energy requirements of coral polyps.²³ As was noted, the decrease in light levels as depth increased limited coral density and reef formation because of the need to acquire energy from photosynthesis. Further, naturally occurring sediment at freshwater outlets reduced light levels for corals and again contributed to the absence of coral reefs at such points. These were natural limits on the ability of corals to gain energy from the photosynthetic process. However anthropogenic increases in sediment and pollution can also reduce the photosynthetic rate of zooxanthellae.

Discharging sewage into marine waters is practised around the world. This increases both the level of nutrients found in the water, and particle suspension when the sewage breaks down.²⁴ The latter increases sediment levels in the water in terms of density, often over a greater area, whilst the former results in algal blooms and increases in phytoplankton in the water.²⁵ Both inhibit the penetration of light and therefore the potential for photosynthesis.

Second, in relation to (ii), the increases in nutrients can alter coral reef ecosystem community structures which, as this study has indicated, are complex and finely balanced. Algae flourish where nutrient supply is good such that where levels are artificially increased the algae can overgrow and kill the coral as well as preventing the dispersal of coral larvae to new areas.²⁶

²³ *Supra* Chapter 2 at 8.

²⁴ Nybakken, *supra* n. 13 at 479.

²⁵ Spalding, *supra* n. 1 at 57.

²⁶ *Ibid.*

Finally, reproduction, dispersal and recovery of corals are also hampered by increased pollution and sedimentation. Coral larvae need to settle on solid substrata in order to become established. An increase in fine silts settling on the sea floor deprives larvae of such conditions and therefore limits the ability of corals to disperse. It has also been suggested that oil pollution can harm the reproductive systems of corals, affect coral larvae and alter the physical properties of reefs.²⁷ However these factors may combine, it has been observed that following severe perturbations to corals (such as prolonged exposure to the sun and air following low tide), recovery in polluted environments may never be fully achieved.²⁸

The causes of increased sedimentation and pollution are linked to the growth of human populations and urban development.²⁹ By way of illustration, Nybakken recounts experiences at Kaneohe Bay on the Island of Oahu in Hawaii.³⁰ Urbanisation following the outbreak of the Second World War resulted in a tenfold increase in domestic sewage discharges and in increased sedimentation, particularly from storm run-off. As a result, two-thirds of the corals that had once thrived in the bay were destroyed and

²⁷ NOAA, *Oil Spills in Coral Reefs* (NOAA) (2001) at 29. It is worth noting that certain species of warm water coral are able to remove oil from their outer surfaces through secreting mucus – R. Endean, “Destruction and recovery of coral reef communities” in O. Jones and R. Endean (eds), *Biology and Geology of Coral Reefs Vol. 3* (Academic Press) (1976) 215 at 233-234.

²⁸ Y. Loya, “Recolonization of Red Sea Corals Affected by Natural Catastrophes and Man-Made Perturbations” (1976) 57 *Ecology* 278 at 285. In comparison, the recovery of another local reef which was not subject to pollution from the local oil facilities at the port of Eilat, (the control reef) showed signs of recovery. Loya concluded that the recovery of reefs unperturbed by human pollution was mainly a function of time.

²⁹ K. Fabricius, “Effects of terrestrial runoff on the ecology of corals and coral reefs: review and synthesis” (2005) 50 *Marine Pollution Bulletin* 125 at 125, and more generally on the effects of sedimentation and pollution.

³⁰ Nybakken, *supra* n. 13 at 479.

green algae came to dominate. In 1978, sewage discharges were eliminated, and by 1983 the turbidity of the water had been reduced and corals were starting to recover.

Increases in sediment and nutrient levels are also linked to the need to feed growing populations. As agricultural development pushes ahead, the required land clearance and enrichment of soils with fertilisers, causes more soil and fertiliser to enter the catchments of fresh water river systems and ultimately the sea.

Oil pollution is a far more limited concern for corals given their ability to secrete mucus, thereby clearing away oil deposits.³¹ Such pollution is commonly the result of vessels discharging ballast water from oil tanks or when such tanks are cleaned, rather than the less frequent (but more widely publicised) oil spills caused by ships running aground or breaking up. Areas which suffer from such pollution include the Gulf of Aden, the Panama Canal and the port of Eilat, which was the subject of Loya's study between 1969 and 1973.³²

2.2 FISHING

Increasing population levels in coral reef areas and modern fishing techniques have placed a huge demand upon coastal fisheries where access to such resources is possible.³³ Such fisheries supply 10% of the world's seafood.³⁴ If the effects of the live fish trade supplying restaurants and aquarium enthusiasts are factored in,³⁵ the need to

³¹ See generally Endean, *supra* n. 27.

³² Loya, *supra* n. 28 at 279.

³³ Spalding, *supra* n. 1 at 59.

³⁴ Vincent, *supra* n. 8 at 183.

³⁵ See generally Vincent, *supra* n. 8.

actively manage harvests of marine life at sustainable levels therefore seems readily apparent.

Human pressure upon coral reef ecosystems from fishing relates to two issues. The first is linked to the methods employed by fishermen and principally causes direct physical impacts to corals and the coral reef. The second is linked to the type and size of harvest to which any given reef is subject.³⁶

2.2.1 *Harm from fishing methods*

Methods of catching fish and other marine animals vary, reflecting the diversity of the life in coral reef ecosystems. Such 'multi-gear' fisheries range from harvesting by hand, use of spears, fish traps and nets. These methods have, over time, been adapted to increase efficiency. For example, the development of masks and spear guns has improved the efficiency with which spear fishermen can catch fish.³⁷ Other methods, however, are less selective and more damaging.

The use of nets on coral reefs results in breakage of corals, particularly the branching form, *Acropora*. Now illegal everywhere, Muro-ami fishing, which involves people (often children) diving down and dropping weighted lines onto coral reefs in order to scare and drive fish towards a pre-set net, causes both physical damage from the use of nets and the action of the weights falling on the coral.³⁸

³⁶ For a similar division into direct and indirect impacts see S. Jennings and N. V. C. Polunin, "Impacts of Fishing on Tropical Reef Ecosystems" (1996) 25(1) *Ambio* 44 at 44.

³⁷ Spalding, *supra* n. 1 at 48.

³⁸ Souter and Linden, *supra* n. 3 at 665 and Spalding, *supra* n. 1 at 48.

Blast fishing is a particular problem in South-East Asia and East Africa.³⁹ These explosives are often home-made from fertilisers, and bottles or drums. Such devices are detonated after lighting a fuse and dropping them into the water. One estimate claims that a bottle bomb containing 0.5 kg of explosive will shatter all the coral reef structure within a 1.15m radius and that a gallon-sized drum filled with explosives will reduce the coral reef to rubble within a 5m radius.⁴⁰ The killing zone of fish and invertebrates is far wider.

The impacts of such blast fishing are far more complex than simply reducing coral skeletons to rubble. Diversity on coral reefs, as was noted in Chapter 2,⁴¹ is partly the result of the complex topography which offers various habitats for marine animals. Destruction of this topography therefore reduces that variety. Further, as with the various netting techniques noted earlier, blast fishing is indiscriminate and leads to many fish being left. Fish may also be recovered by other marine animals and birds before they can be harvested by humans, or they may fall into areas where they cannot be recovered. Blast fishing is therefore extremely wasteful.

The demand for live fish from the aquarium trade and from restaurants in Asian countries⁴² drives another form of fishing. The use of organic or cyanide based poisons to stun fish which can then be harvested live has grown as a practice ever since its

³⁹ Souter and Linden, *supra* n. 3 at 664.

⁴⁰ Jennings and Polunin, *supra* n. 36 at 45.

⁴¹ *Supra* Chapter 2 at 17.

⁴² Vincent records that 30,000 – 35,000 tonnes of such live fish was imported into Hong Kong in the 1990's, accounting for 60% of such demand. These fish were sourced from Australia, Vietnam, Indonesia, Malaysia and the Philippines. Vincent, *supra* n. 8 at 187-188.

introduction in the 1960s in the Philippines.⁴³ Whilst the effects of such poisons on corals and human consumers are only just being explored, this practice also encourages unsustainable catch levels since non-target fish die as by-catch, whilst target fish may not survive the effects of the poison when in transit.⁴⁴

Such destructive practices can combine to severely degrade coral reef ecosystems through their direct impact upon the reef structure and the ecosystem as a whole. In January 2003, the World Conservation Union (hereafter “IUCN”) noted how the combination of blasting and cyanide fishing was a major contributor to the degradation of reefs around Nha Trang Bay in Vietnam.⁴⁵ The elimination of such practices, which destroy reefs and result in the death of non-target fish as by-catch, is regarded as a prerequisite to any quotas supporting sustainable fisheries.⁴⁶

2.2.2 Fisheries Management and Quotas

Turning now to the more indirect impacts of fishing, managing fisheries in terms of catch size and composition is of key importance in combating the negative effects of unsustainable harvesting of marine life. Modern day demands have already been discussed above in terms of benefits, whether as a source of protein or to supply the lucrative aquarium trade. But uncontrolled exploitation of these resources can lead to a number of different negative impacts. Further, growing populations and the availability of improved fishing apparatus have increased this pressure in recent years.

⁴³ D. Bryant, *Reefs at Risk – a Map-Based Indicator of Threats to the World’s Coral Reefs* (WRI) (1998) at 15. Bryant estimates that more than 1 million kilograms of cyanide has been squirted onto Philippine reefs since the introduction of cyanide fishing.

⁴⁴ Vincent, *supra* n. 8 at 186.

⁴⁵ IUCN Press Release, *A Balancing Act – Reversing the Trend in Nha Trang Bay* 16th January 2003.

⁴⁶ Jennings and Polunin, *supra* n. 36 at 45.

Excessive fishing on coral reefs naturally leads to a reduction in the abundance and average size of specimens, ultimately resulting in populations of immature individuals. If such overfishing continues, then reproduction rates fall. The effects of such overfishing, if identified in time, can be reversed following the cessation of fishing activities. However, ecosystems have limits beyond which continued fishing will have irremediable effects. The experiences of Jamaica are often cited by way of illustration.⁴⁷

Studied continuously since the 1950's, Jamaican reefs are probably some of the best recorded on the Earth and local human impacts some of the best studied over a long period of time.⁴⁸ Population pressures in the 1960's led to increased demands for food which naturally were satisfied from the abundant life found on fringing reefs.⁴⁹ The Jamaican fisheries began to overexploit the resource so that by the beginning of the 1970's the biomass on Jamaican reefs had been reduced by 80%. Composition of reef species changed (an indicator of overfishing⁵⁰) so that Sea Urchins became the dominant grazers on algae allowing the coral to remain dominant.⁵¹ Nevertheless the change in composition of reef species, caused by the removal of competing herbivorous

⁴⁷ Austin, *supra* n. 2 at 13; Souter and Linden, *supra* n. 3 at 666; Nybakken, *supra* n. 13 at 415.

⁴⁸ Nybakken, , *supra* n. 13 at 415.

⁴⁹ *Ibid.*

⁵⁰ For similar links between fishing and sea urchin populations, see M. Watson and R. F. G. Ormond, "Effect of an Artisanal Fishery on the Fish and Urchin Populations of a Kenyan Coral Reef" (1994) 109 *Mar. Ecol. Prog. Ser.* 115 at 122.

⁵¹ W. Precht and R. Aronson, "Death and resurrection of Caribbean coral reefs" in I. Côté and J. Reynolds (eds), *Coral Reef Conservation* (CUP) (2006) 40 at 42.

fish, such as surgeon fish, and urchin predators, such as trigger fish, placed an over-reliance upon urchins to maintain that coral dominance.⁵²

Corals continued to survive whilst the sea urchins kept the competing algae in check, even following significant storm damage in 1980. However, a water-born disease which appeared in 1982 spread through the sea urchin population,⁵³ reducing numbers by 99%.⁵⁴ Consequently, algae came to dominate the shallow waters. Coral cover along the Jamaican coastline fell from 52% in 1977, to 3% by 1993, with algal cover increasing by up to 92% at the end of the same period.⁵⁵

Traditional single-species management approaches are difficult to apply to reef-based fisheries as the complex interactions of species clearly demand a more ecosystem-based management approach.⁵⁶ Recognising this is one challenge, adopting the appropriate

⁵² *Ibid.*

⁵³ The origin of the disease may have been natural or may, it has been suggested, have been introduced through the Panama Canal or in the ballast water of a vessel. See Spalding, *supra* n. 1 at 61. It is doubted by the author whether the particular incident (and the problem more generally) could have been prevented had the reefs of Jamaica been contained within a marine protected area (“MPA”). This is because, once ‘piggy-backed’ into the region, the opportunity for dispersal of such species or diseases across what are ultimately just cartographic boundaries, seems a credible possibility. It is for this reason that the problem needs to be addressed through controlling the pathways of introduction. However, such invasive species could clearly have an undermining effect upon the reaching of conservation objectives within MPAs if a state or region does not have regulations and facilities in place for controlling the release of such alien diseases or species into local non-protected waters, such as ports. The presence of an MPA might therefore be an influence on tighter national or localised regulation of vessels navigating or docking in the immediate vicinity. Further, given the level of monitoring in these enclaves, arrival of invasive species might be discovered early and preventative action can be taken to control the negative effects of the species’ introduction. For further support, see J. Davies (ed), “Invasive Species: Their Threat to MPAs, and How Practitioners are Responding” (2005) 6(6) *MPA News* 1.

⁵⁴ Nybakken, *supra* n. 13 at 415.

⁵⁵ *Ibid.*

⁵⁶ Jennings and Polunin, *supra* n. 36 at 44.

management structure given this state of affairs – whether limiting the number of fishers through permits, limiting the permitted hours for fishing, designating no-take zones, the size of catch, or a combination of these – is a far harder proposition.⁵⁷ Further, Jennings and Polunin suggest that whichever approach is adopted, and provided wasteful and destructive fishing practices are eradicated, it should not be forgotten that coral reef fisheries should be managed on the basis of harvesting a diverse range of fish and invertebrates.⁵⁸ By-catch is consumed rather than wasted, although this would require consumers to broaden their dietary intake.

Of course, whilst ecosystem-based management approaches are key to the general protection of coral reef fish stocks, some individual species will remain the target of fishing because of their particular value to the market. As Austin records, queen conch and giant clams are heavily exploited for their meat, with the Philippines exporting 252 tonnes of the latter to Taiwan and Japan in 1990, whilst demand for *beche de mer* places pressure upon populations of sea cucumber.⁵⁹ Further, Spalding notes that Wrasse and Grouper populations in Southeast Asia have been drastically reduced because of the demand for live imports from Asian restaurateurs causing the search for such fish to spread into previously untouched areas of the Indian Ocean and Western Pacific.⁶⁰ He also notes that it is often the larger fish which have the greatest

⁵⁷ T. McClanahan, “Challenges and accomplishments towards sustainable reef fisheries” in I. Côté and J. Reynolds (eds), *Coral Reef Conservation* (CUP) (2006) 147 at 165

⁵⁸ Jennings and Polunin, *supra* n. 36 at 48.

⁵⁹ Austin, *supra* n. 2 at 9.

⁶⁰ Spalding, *supra* n. 1 at 49. See also Vincent, *supra* n. 8.

reproductive potential and market value and therefore recovery of populations is slow where they are targeted.⁶¹

Fishing in areas where there is no affordable alternative protein source, coupled with the potential returns from trade in live fish, can therefore have serious negative effects upon coral reef ecosystems.

2.3 CLIMATE CHANGE

In September 2001, the Intergovernmental Panel on Climate Change (“IPCC”) provided a number of observations in its summary of findings for policymakers.⁶²

Notably, the IPCC indicated that:

- (a) global average surface temperatures would rise between 1.4°C and 5.8°C between 1990 and 2100. This figure is an upward revision from the IPCC’s previous report;
- (b) global mean sea levels will rise by 0.09 to 0.88m over the same time period;
- (c) ecological productivity and biodiversity would be altered and the risk of extinction increased for some species from related disruptive events;
- (d) precipitation levels would be more intensive, leading to greater surface run-off and soil erosion;
- (e) increases in the intensity of tropical storms would lead to increased damage to coastal ecosystems like coral reefs;

⁶¹ *Ibid.*

⁶² IPCC, *Climate Change 2001: Synthesis Report. Summary for Policymakers* (2001). An online copy is available at www.ipcc.ch.

(f) there is new and stronger evidence linking human activities to warming climatic changes; and

(g) the projected rate and magnitude of warming and sea-level rise can be lessened by reducing anthropogenic greenhouse gas emissions.⁶³

It seems therefore that the impacts upon coral reef ecosystems of climatic change relate to sea level change, increased water temperatures, greater damage caused by storms and increased turbidity. Additionally, scientists are considering the impact of increased levels of CO₂ and UV radiation. Some of these impacts have already been discussed, but others will be analysed below. Overall, many now consider the negative effects of global warming to be the greatest threat to the future of coral reef ecosystems.⁶⁴

In isolation, sea level change should not adversely affect corals. It is believed that many coral reefs have already reached their upward limit of growth and that such constraints would be broken by increases in the levels of the oceans.⁶⁵ Coral reefs are known to grow at rates of 10-100cm per 100 years and therefore the predicted rate of sea level change will not pose problems.⁶⁶ However, if the ability for coral reefs to grow is significantly impaired by other human pressures, or as a result of the following stresses

⁶³ *Ibid* in relation to (a) at 8, (b) and (c) at 9, (d) and (e) at 15, (f) at 5 and (g) at 19. The Fourth Assessment Report is currently in the process of being finalised for publication by the various working groups which contribute sections. The IPCC Working Group I's *Summary for Policymakers* was approved in February 2007 and provides broadly similar figures and assessments (available at www.ipcc.ch). Temperature change predictions will be given as 1.8°C to 4.0°C (at 13), sea-level rise at an adjusted 18cm-59cm (at 13) and the remaining observations are made with higher confidence.

⁶⁴ C. Wilkinson, *Status of Coral Reefs of the World – Executive Summary* (GCRMN) (2002) at 7 available at www.gcrmn.org.

⁶⁵ N. Chadwick-Furman, "Reef coral diversity and global change" (1996) 2 *Global Change Biology* 559 at 566.

⁶⁶ *Ibid*. The most recent sea-level change figures do not appear to affect this conclusion, *supra* n. 63.

linked to global warming, then sea level change may begin to represent more of a challenge to corals.⁶⁷

The effects of increased levels of UV radiation are poorly understood although there is a suspicion that such radiation is having a damaging effect upon planktonic larvae. If so, this would have implications for the viability of corals to reproduce and disperse in such a manner.⁶⁸

The actual impact of increased levels of carbon dioxide upon coral reefs is also currently unknown, and only predictions based upon mathematical modelling and theoretical chemistry are available. Bearing that in mind, initial research suggests that if carbon dioxide saturation in water increases, so the presence of carbonate compounds (which are key to calcification) decreases.⁶⁹ Further, these projections also indicate that, even though carbonate compounds will be most abundant in tropical waters, concentrations will still have dropped in such latitudes to levels resulting in a significant reduction in calcification rates by 2100.⁷⁰ The consequences would be weaker coral skeletons and greater erosion of coral reefs, particularly by wave action and during storms. Further, it is suggested that expansion of warmer sea surface temperatures into higher latitudes does not automatically imply an expansion of coral

⁶⁷ O. Hoegh-Guldberg, "Climate change, coral bleaching and the future of the world's coral reefs" (1999) 50 *Marine Freshwater Research* 839 at 859.

⁶⁸ Chadwick-Furman, *supra* n. 65 at 566.

⁶⁹ R. Feely *et al*, "Impact of Anthropogenic CO₂ on the CaCO₃ System in the Oceans" (2004) 305 *Science* 362 at 365.

⁷⁰ J. A. Kleypass *et al.*, "Geochemical Consequences of Increased Atmospheric Carbon Dioxide on Coral Reefs" (1999) 284 *Science* 118. For the criticism of this and related articles, see S. Idso and K. Idso, "CO₂ and Coral Calcification: Is the Tide of Pessimism About to Turn?" (2002) Editorial Comment v.5 (12) Center for the Study of Carbon Dioxide and Global Change (copy available at www.co2science.org).

reefs into these waters. This is principally because of the insufficient levels of saturated carbonate compounds at these latitudes.⁷¹

Mass coral bleaching has been headline news in the last decade, in particular following the event of 1998 in which 16% of the world's corals were killed in a period of nine months.⁷² When corals are placed under stress, in most cases they expel their zooxanthellae or simply the pigment in the zooxanthellae, taking on a bleached appearance as their skeletons become visible.⁷³ This reduces the amount of energy the coral gains from the photosynthetic process and impairs calcification. If the stress which induces the bleaching persists over a prolonged period, this loss of energy supply impairs reproduction, growth and ultimately leads to the death of corals.⁷⁴ One of the main causes of stress known to induce bleaching is an increase in water temperature⁷⁵ and it is this fact which places coral reefs in particular danger from the global warming phenomenon.

The El Niño-Southern Oscillation ("ENSO") has often been linked to bleaching caused by temperature stress as it can cause abnormally high (albeit temporary) sea surface temperatures.⁷⁶ The link to global warming is that, assuming corals and their

⁷¹ Kleypass, *ibid* at 119.

⁷² C. Wilkinson, *Status of Coral Reefs of the World: 2000*, (GCRMN) (2000) at 1. An online copy is available at www.gcrmn.org.

⁷³ Hoegh-Guldberg, *supra* n. 67 at 847.

⁷⁴ *Ibid* at 849.

⁷⁵ E. Williams and L. Bunkley-Williams, "The world-wide coral reef bleaching cycle and related sources of coral mortality" (1990) 335 *Atoll Research Bulletin* 1 at 33

⁷⁶ As recorded by Trenberth, "El Niño" originally applied to the running (around Christmas) of a warm current in a southerly direction along the coastal waters of Peru and Ecuador. Today it is used by scientists to describe the warm phase of a different phenomenon, the El Niño-Southern Oscillation ("ENSO"), when there is an increase in ocean temperatures in the Pacific Basin and sea level atmospheric pressure in the Western Pacific. The cold phase of ENSO events is called "La Niña". The

zooxanthellae cannot adapt at a pace matching the increases in average sea temperatures linked to climate change, then ENSO's with a weaker warming phase will cause maximum temperatures to be exceeded on a regular basis.⁷⁷ Ultimately, the sea surface water temperatures may themselves exceed those maximum temperatures on an annual basis due to climate change and it has been predicted that this point will be reached in some areas within the next 30-50 years.⁷⁸ In relation to corals adapting to these temperature changes, Hoegh-Guldberg notes that, whilst research needs to be undertaken, recent history does not suggest that corals or their zooxanthellae have so far been able to adapt as, in the last 20 years, bleaching events have increased in frequency at the same sites.⁷⁹

Recovery following the last major mass bleaching event in 1998 has been mixed. Corals are showing "*slow to steady*" signs of recovery, although not where reefs are subject to human pressures such as over-fishing, high sedimentation levels or nutrient pollution.⁸⁰

general public, however, tend to use the term "El Niño" as the term for the whole ENSO event. K. Trenberth, "The Definition of El Niño" (1997) 78(12) *Bulletin of the American Meteorological Society* 2771 at 2771-2772 and 2777.

⁷⁷ Hoegh-Guldberg, *supra* n. 67 at 852.

⁷⁸ *Ibid* at 853.

⁷⁹ Hoegh-Guldberg, *supra* n. 67 at 856. Recent findings from Australia, however, indicate that the ability of a species of coral to acclimatise may be improved where different types of zooxanthellae are present in the coral polyp. The findings indicate that time may be bought for such coral species where they can alter the proportion of one type of zooxanthellae over another, leading to the dominance of a more heat tolerant type; see R. Berkelmans and M. J. H. van Oppen, "The Role of Zooxanthellae in the Thermal Tolerance of Corals: A 'Nugget of Hope' for Coral Reefs in an Era of Climate Change" 2006 *Proc. R. Soc. B* 1 (published early online, 8 June 2006 at www.journals.royalsoc.ac.uk).

⁸⁰ Wilkinson, *supra* n. 64 at 7.

The bleaching of corals as a result of increases in sea surface water temperatures linked to ENSO events, together with the other complicating and damaging consequences of climate change, are clearly of paramount concern to those involved in the conservation of coral reef ecosystems.

2.4 NON-FISHING RELATED PHYSICAL DAMAGE

Human induced physical damage to coral reefs is also the result of non-fishing activities. Such damage is commonly related to two issues, namely coral mining and tourism.

Smaller island nations, particularly those occupying Atolls, have few resources in terms of building materials.⁸¹ In the past, people living in such states have met their needs through utilising broken, fossilised and dead coral reef as well as using coral rock to produce lime for mortar, plaster and for agricultural purposes.⁸² However, demand has increased in recent years leading to the unsustainable mining of coral rock from local reefs.⁸³ Recovery from such activity is negligible according to Austin and leads to reduced coastal protection.⁸⁴ Whilst such practices may be outlawed in most states, illegal mining is both lucrative and the law difficult to enforce.⁸⁵

The impacts of tourism have already been discussed earlier in this chapter in the context of developments to cater for the growing numbers of tourists leading to increased demand for food, sedimentation and nutrification. However, tourism can have

⁸¹ Austin, *supra* n. 2 at 17.

⁸² *Ibid.*

⁸³ Souter and Linden, *supra* n. 3 at 662.

⁸⁴ Austin, *supra* n. 2 at 17.

⁸⁵ *Ibid* at 18.

more direct physical impacts. Reclamation of coastal areas for resort development leads to loss of coral reef and other habitats, including lagoon or mangrove ecosystems.⁸⁶ The latter are particularly important as they help to support the coral reef ecosystem, e.g. through trapping riverine sediments and providing safe waters for juvenile reef fish.⁸⁷

Further, as this study has indicated, diving has rapidly expanded as a recreational activity for many tourists, but the effects of such activities are poorly understood. Certainly, without careful co-ordination at dive sites, dive boats can cause physical damage where anchors are dropped or boats run aground. The direct impact of large numbers of divers is believed to include breaking corals where reefs are used as hand holds or where they are knelt upon or kicked by fins.⁸⁸ Such damage is likely to be more considerable where inexperienced divers, who have not mastered buoyancy control, are frequent visitors. Additionally, scientists also believe that the disturbance of bottom sediments as divers swim over reefs may stress organisms.⁸⁹

That said, it is not believed that such activity causes coral reef ecosystems long term harm, particularly in comparison to the damage caused by fisheries and mining.⁹⁰ However the impacts do cause the reefs to become less aesthetically attractive causing divers to move to other more pristine reefs.⁹¹ If reefs are to be sustainably managed in

⁸⁶ G. Jobbins, "Tourism and coral-reef-based conservation: can they coexist?" in I. Côté and J. Reynolds, *Coral Reef Conservation* (CUP) (2006) 237 at 240-242; UNEP/WCMC, *supra* n. 14 at 9-10.

⁸⁷ P. Mumby and A. Harborne, "A seascape-level perspective of coral reef ecosystems" in I. Côté and J. Reynolds, *Coral Reef Conservation* (CUP) (2006) 78 at 78.

⁸⁸ Jobbins, *supra* n. 86 at 239-240.

⁸⁹ D. Davies and C. Tisdell, "Recreational scuba-diving and carrying capacity in MPAs" (1995) 26(1) *Ocean & Coastal Management* 19 at 32

⁹⁰ Jobbins, *supra* n. 86 at 241.

⁹¹ Davies and Tisdell, *supra* n. 89 at 32.

order to maximise income from the diving industry, establishing the level of diving activity which will not cause this aesthetic damage is therefore of importance. Managing access accordingly may require stricter controls than management simply based upon biological considerations.

3. SUMMARY

This chapter has demonstrated how pollution, increased sedimentation, fishing impacts (both direct and indirect), climate change and human-induced physical damage are threatening coral reef ecosystems and, in consequence, the bounty such ecosystems have provided the human race. It has also been observed that recovery rates of coral reef ecosystems from natural and man-made impacts (such as climate change) are inhibited where other anthropogenic stresses are common. It therefore seems apt to quote at the conclusion of this part from Souter and Linden's own closing comments to their analysis on the health and future of coral reefs:

The United Nations Environmental Programme (UNEP) uses an African Proverb that states, 'we have not inherited the earth from our parents but rather we have borrowed it from our children'. If anthropogenic stresses on coral reefs are not reduced in the near future we seriously risk defaulting on that loan and becoming environmentally bankrupt.⁹²

In response to such calls, many strategies have been employed by the international community, states and non-governmental organisations. In the following chapter the strategies used to conserve coral reef ecosystems will be explored, with a particular emphasis upon one strategy, namely marine protected areas.

⁹² Souter and Linden, *supra* n. 3 at 683.

CHAPTER FOUR – CONSERVATION STRATEGIES

AND MARINE PROTECTED AREAS

1. INTRODUCTION

Whilst the anthropogenic threats faced by coral reef ecosystems seem numerous and varied in their scale, conservation efforts to deal with these threats can be understood as amounting to two simple pursuits. These are management and education.

In relation to the latter, in 1982 Gomez stated his belief that:

Apparently deep-seated in the social fabric is the inability to reconcile drive for economic gain with the obvious wisdom of long-term planning and conservation.¹

Consequently, re-educating those who pursue such unsustainable practices, at both the community and government level, has often been recognised as being of priority in conservation activities.² Spalding claims that scientists, ecologists, lawyers and economists have reached the same conclusion, namely, that the central message should indicate that immediate economic gains through unsustainable harvesting of coral reef resources, pollution, poor agricultural practices and unplanned development cause short term harm and more serious impacts in the longer term.³ In contrast, management based

¹ E. D. Gomez quoted in B. G. Hatcher *et al.*, “Review of Research Relevant to the Conservation of Shallow Tropical Marine Ecosystems”, (1989) 27 *Oceanogr. Mar. Biol. Annu. Rev.* 337 at 282-3.

² L. Browning *et al.*, “Education as a tool for coral reef conservation: lessons from marine protected areas” in I. Côté and J. Reynolds, *Coral Reef Conservation* (CUP) (2006) 419 at 419.

³ M. D. Spalding *et al.*, *World Atlas of Coral Reefs*, (University of California) (2001) at 67

upon sustainable use and planning can bring immediate economic rewards and social benefits.⁴

Of course, dealing with educational issues goes beyond simply informing local communities. Society must also seek to close gaps in its scientific knowledge. It has, for example, been said that whilst man is increasingly coming to understand the extent and causes of coral reef ecosystem degradation, there is little or no data on the consequences for humans of such degradation.⁵ Such short-comings may in turn have implications for the priority afforded to conservation of these ecosystems by states.⁶

With respect to management, states recognise that global climate change and emissions of greenhouse gases must be managed in accordance with some form of international co-operation. A number of states have therefore subscribed to the legal regime established by the 1992 United Nations Framework Convention on Climate Change⁷ and Kyoto Protocol.⁸ The same can be said with respect to managing demand through international trade for species taken from coral reef ecosystems, through the international community's reliance upon the 1973 Convention on International Trade in Endangered Species ("CITES").⁹

⁴ *Ibid.* Examples of such findings will be explored further in this section.

⁵ R. S. Dimitrov, "Confronting Nonregimes: Science and International Coral Reef Policy" (2002) 11(1) *Journal of Environment & Development* 53.

⁶ *Ibid.* Dimitrov's arguments are explored in a little more detail in the following chapter, however, the author disagrees with the article's assertion that prompting international action depends upon prior proof of transboundary consequences from habitat degradation.

⁷ 31 *ILM* 851.

⁸ 37 *ILM* 22.

⁹ 12 *ILM* 1085.

Management efforts can also exist at the national level, from developing successful captive breeding programmes in order to supply the aquarium trade,¹⁰ to national fisheries laws prohibiting use of destructive fishing methods, limiting catch size and establishing fishing seasons.¹¹ Also of great importance at the national level is the introduction of management planning for development on land in order to control the effects of pollution and sedimentation. One such management tool is the requirement that developments are subject to environmental impact assessment before they begin.¹² However, it is important that the different actors and agencies at the national level involved in the programmes such as those discussed above, work together in a manner which reflects the fact that coastal habitats are inter-linked amongst themselves (such as mangroves, sea-grass beds and coral reefs) and with freshwater resources and land management. Governments are therefore being encouraged,¹³ particularly through the work of initiatives such as the UNEP Global Programme of Action for the Protection of the Marine Environment from Land-based Activities, to formulate Integrated Coastal

¹⁰ 99% of species used in the aquarium trade are captured from the wild, with aquaculture being either difficult (e.g. live coral rock developed through aquaculture is only economically viable for the faster growing species) or open to criticism for denying communities in developing countries the opportunity to sustainably manage their fisheries. As an alternative, at the national level communities can choose to certify their wild trade through an international accreditation body such as the Marine Aquarium Council which sets standards of conservation management, resource collection and transport in order to create a sustainable industry. All of the above is described in detail in C. Wabnitz *et al.*, *From Ocean to Aquarium: The Global Trade in Marine Ornamental Species* (UNEP-WCMC) (2003) at 48-54.

¹¹ Wilkinson notes that dynamite fishing is largely prohibited throughout Southeast and East Asia. C. Wilkinson, "Status of coral reefs of the world: summary of threats and remedial action" in I. Côté and J. Reynolds (eds), *Coral Reef Conservation* (CUP) (2006) 3 at 23.

¹² For a more detailed consideration of environmental impact assessments and the conservation of coral reef ecosystems, see J. Turner *et al.*, "Environmental impact assessment for coral reefs: advocating direct protective approaches" in I. Côté and J. Reynolds (eds), *Coral Reef Conservation* (CUP) (2006) 332.

¹³ Agenda 21 (UNCED Report, A/CONF.151/26/Rev.1 (vol. I) (1993)) para 17.6 called for states to consider developing ICZM plans.

Zone Management plans (“ICZM”) to co-ordinate these actors, agencies and policies for the sustainable development of coastal resources.

Whilst a number of international and national conservation strategies have already been mentioned, Wilkinson suggests that one of the best ways to protect coral reef ecosystems is to establish marine protected areas (“MPAs”).¹⁴ It is the way in which international law promotes MPAs for the conservation of coral reef ecosystems which forms the core of this study. However, it is important to remember that MPAs are just one amongst a number of national and international strategies (such as trade regulation, addressing climate change, and national laws banning certain fishing practices) which must be pursued in order to help these marine habitats. Further, as has been mentioned, a degree of co-ordination and recognition that these strategies rely upon each other’s implementation is required - preferably through ICZM plans. Against this background, the characteristics, benefits, limitations and requirements for MPAs will be discussed in the remaining parts of this chapter in order to appreciate and critically examine the steps which have been taken under international law to promote these strategies for the conservation of coral reef ecosystems.

2. UNDERSTANDING MARINE PROTECTED AREAS

2.1 DEFINING MARINE PROTECTED AREAS

For the purposes of this study, an MPA is a geographically defined area of the sea and (possibly also) shore which is designated or regulated and managed to achieve specific conservation objectives.¹⁵

¹⁴ Wilkinson, *supra* n. 11 at 33-34.

¹⁵ For support of this approach see the definition of a protected area in IUCN, *Protected Areas: Benefits Beyond Boundaries – WCPA in Action* (IUCN) (2000) at 5 and the definition of MPA in G. Kelleher and

Conservationists have for some time pursued their goals through such enclave strategies whereby areas of land and/or sea are set aside for the protection of a given species or habitat found within that area. The earliest enclaves were predominantly terrestrial and MPAs therefore represent attempts to extend the enclave strategy into the marine environment.

This move has been supported by the publication of various guides and the formulation of management tools in order to help states achieve their policy objectives for MPAs. Such material provides an opportunity to clarify what is meant by MPA, understand their strengths and limitations, and establish the best practices for their creation and operation. By spending time at this stage exploring these three areas, this study will be in a better position to judge the steps taken in international law to conserve coral reef ecosystems through MPAs.

2.2 UNDERSTANDING THE LIMITATIONS OF MPAS

It must be remembered that not all threats to ecosystems can be tackled through enclave strategies. For example, whilst controlling access to resources is a function of MPAs and can be a key tool in creating a sustainable export industry,¹⁶ regulating international imports and exports for natural products is not and is therefore currently being tackled through CITES' permit system. Further, man's activities on land will not normally be covered by an MPA, yet the potential impact of such activities on MPA management objectives can be significant, as was highlighted in Chapter 3 in the context of

C Recchia, "Editorial – lessons from marine protected areas around the world" (1998) 8:2 *Parks* 1 at 1. Further the 1992 Convention on Biological Diversity defines a protected area as:

... a geographically defined area which is designated or regulated and managed to achieve specific conservation objectives. (Article 2)

¹⁶ See for an example in the context of the aquarium trade, C. Wabnitz, *supra* n. 10 at 56-57.

sedimentation and pollution threats to coral reef ecosystems.¹⁷ This emphasises that, whilst land based sources of pollution, building developments and agricultural practices will often not be tackled by an MPA, it is important to formulate ICZM policies to include and reflect MPA strategies.¹⁸

Finally, global climate change cannot be addressed through designating an area for protection, although MPAs may protect affected habitats from other anthropogenic threats, thereby increasing their ability to recover from the effects of climate change.¹⁹ However, the impact of climate change upon enclave strategies as an idea for conservation efforts has been called into question. As Bowman notes:

The phenomenon of global warming represents a fundamental threat to the integrity of such reserves in view of the poleward dispersal of species it implies. Many of them will end up, quite simply, in the wrong place.²⁰

If this were to happen, the international treaties which are to be considered in this study would need to incorporate provisions allowing for flexibility over the geographic boundaries of enclaves and also the promotion of such flexibility at the national legislative level.²¹ That said, and as was discussed in Chapter 3,²² in recent years

¹⁷ *Supra* Chapter 3 from 26.

¹⁸ R. V. Salm *et al*, *Marine and Coastal Protected Areas: A Guide for Planners and Managers* (IUCN) (2000) at 107.

¹⁹ L. Hansen, "Increasing the resistance and resilience of tropical marine ecosystems to climate change" in L. Hansen, J. Biringer and J. Hoffman (eds), *Buying Time: A user's manual for building resistance and resilience to climate change in natural systems* (WWF) (2003) 157 at 165-166.

²⁰ M. J. Bowman, "Global Warming and the International Legal Protection of Wildlife" in R. Churchill and D. Freestone (eds), *International Law and Global Climate Change* (Graham & Trotman) (1991) 127 at 135.

²¹ *Ibid* at 141.

²² *Supra* Chapter 3 at 36.

understanding of the impacts of climate change on coral reefs has increased and it is now doubted whether such poleward dispersal will be reflected in coral reef distribution.²³ Whilst therefore a relevant factor for other ecosystems, such concerns may not be so relevant for coral reef ecosystems.

2.3 POTENTIAL MPA OBJECTIVES

MPAs can achieve a number of important results. Some have already been mentioned as indirect benefits, such as early warning of the arrival of invasive species,²⁴ and enhancing the resilience and resistance of corals to the negative effects of climate change by reducing or eliminating other anthropogenic threats.²⁵ Nevertheless, one of the more common objectives of MPAs is the management of resource utilisation, thereby tackling the negative direct and indirect impacts of fishing,²⁶ and tourist activity.²⁷ Through such regulation, the area within an MPA might then serve to catalyse the restoration of degraded coral reef ecosystems in the vicinity through coral larvae recruitment from enclaves and re-stocking of fish.²⁸ For example, and in the fisheries context, by designating the whole or part of an MPA as a no-catch area, instances of stock replenishment inside enclaves and in bordering fishing areas (as fish populations have spilled outside of park boundaries) have been recorded in the

²³ J. A. Kleypass *et al.*, “Geochemical Consequences of Increased Atmospheric Carbon Dioxide on Coral Reefs” (1999) 284 *Science* 118.

²⁴ *Supra* chapter 3, n. 53.

²⁵ *Supra* n. 19.

²⁶ *Supra* chapter 3, n. 36.

²⁷ *Supra* chapter 3, at 40.

²⁸ C. Roberts *et al.*, “Redesigning coral reef conservation” in I. Côté and J. Reynolds (eds), *Coral Reef Conservation* (CUP) (2006) 515 at 519

Philippines²⁹ and Florida,³⁰ whilst revenues from park entry fees can be channelled back to communities who have had their ability to fish curtailed.³¹ MPAs therefore play a key role in controlling fishing related threats to coral reef ecosystems as well as being a valuable tool in national fisheries policies.

Managing the impact of tourism upon coral reefs, as well as the relationship between those involved in the tourist industry and fishing, can also be controlled through the creation of an MPA. The number of tourists entering a site can be limited and monitored, as can permitted uses and mooring sites.³² Where the MPA's boundaries permit, controlling tourist development on land in the immediate vicinity may also be possible.

From another perspective, where MPAs are helping to restore coral reef ecosystems or maintain them in an undamaged state, tourists, such as divers, will be more attracted to visiting these reefs. The income that can be generated from such interest, either through park entry fees,³³ or from increasing local business, can go some way to supporting the management of the park, local economies and/or compensating local fishers who may find themselves prevented from fishing in the protected area.³⁴ MPAs should therefore play an important part in national tourism plans.

²⁹ By stopping fishing in 15ha of a 50ha reef area, where the remaining 35ha were open to certain types of fishing, fishermen from Sumilon Island increased their catch from 3,633 kg in 1976 to 6,948kg in the first ten months of 1979. R. V. Salm, *supra* n. 18 at 30.

³⁰ C. M. Roberts *et al*, "Effects of Marine Reserves on Adjacent Fisheries" (2001) 294 *Science* 1920.

³¹ See, for the availability of such funds, Arin, *supra* n. 22.

³² See, for example, the restrictions imposed upon anchoring and fish feeding in the Ras Mohamed National Park, Egypt described by G. Jobbins, "Tourism and coral-reef-based conservation: can they co-exist?" in I. Côté and J. Reynolds (eds), *Coral Reef Conservation* (CUP) (2006) 237 at 246.

³³ Arin, *supra* n. 22.

³⁴ For the negative effects of not re-investing income generated through MPAs, see Jobbins, *supra* n. 32.

By limiting or excluding human impacts, MPAs promote the conservation of natural ecosystems. Thus critical habitats can be protected, the diversity of species can be sustained or restored and ecosystem processes maintained. The designation of areas has therefore been a relevant strategy for those concerned with the conservation of coral reef ecosystems.

3. BEST PRACTICES IN ESTABLISHING MPAS

Whilst various targets have been suggested for the percentage of the oceans which should be covered by reserves and parks,³⁵ there is also concern that MPAs set up without adequate local co-operation, institutional support, funding and capacity will suffer from poor management and become largely ineffective – known as ‘paper parks’.³⁶ The drive for coverage and improving the effectiveness of existing parks are both important goals.

Experience in conserving fragile marine habitats through designating protected areas continues to grow. This expanding knowledge base is increasingly being used to advise governments and interested groups on best practices for adopting such an enclave strategy and for setting up MPAs in the right way so as to avoid the problem of ‘paper parks’. This advice, which can be broadly divided into four themes, will be explored at this stage so as to support later assessments of the substantive content of current international legal provisions for the promotion of MPA strategies.

³⁵ See the 30% target for known tropical coral reefs and seamounts to be protected through MPAs and other strategies being sought under the Convention on Biological Diversity, *infra* chapter 7, part 6, and Roberts, *supra* n. 28 at 520.

³⁶ Spalding, *supra* n. 3 at 70.

3.1 INSTITUTIONAL AND LEGAL SUPPORT

Salm suggests that a state wishing to adopt an enclave strategy in its marine environment should identify a single authority to oversee the implementation of the MPA programme, to ensure that objectives are being met and with the power to commission or conduct research and surveys for planning and management purposes.³⁷ This body should not automatically be an existing body with responsibility for terrestrial parks, especially if it does not have experience of marine matters,³⁸ since marine biodiversity presents different challenges compared to terrestrial counterparts on account of the different interactions through the water-column and man's relative ignorance of marine communities.³⁹

Salm goes on to identify three possible ways for arranging institutional responsibilities to meet the objectives for MPAs, taking account of local circumstances.⁴⁰ The first involves the state maintaining centralised control with the responsible department using its own staff for all matters. Alternatively, the central authority could have satellite units on the ground at regional or local levels which are responsible for everyday running of MPAs. Finally, the responsible organisation may simply act as a monitoring or advisory body, with independent organisations with their own staff running the MPAs.

Each approach could be said to have its merits. Central government organisations might have more resources at their disposal such as funding and expertise, whilst local management can be more responsive to the concerns and needs of the local community.

³⁷ Salm, *supra* n. 18 at 132.

³⁸ G. Kelleher, *Guidelines for Marine Protected Areas* (IUCN) (1995) at 16.

³⁹ A. Pullin, *Conservation Biology* (CUP) (2002) at 175-176.

⁴⁰ Salm, *supra* n. 18 at 137.

Ultimately, the approach taken may have more to do with the political structure of a country, e.g. environmental matters may be centrally administered, the concern of regional governments, or controlled by local communities if customary land tenure and practice dominates – as is the case in some Pacific states.⁴¹

A universal feature of designating and managing an enclave is the restriction or prohibition of certain activities, depending upon the objectives of a given MPA. It is therefore important, in order to ensure compliance with these rules, that there is adequate legal support. The form this takes will again reflect the nature of government in any given state, whilst dedicated legislation for MPAs is often preferable to using existing regulations which may have been drafted for terrestrial parks. That said, matters may be so pressing in a given state that designation of a site may have to take place in advance of more appropriate laws being passed.⁴²

National legislation should therefore cover such diverse elements as designating relevant authorities, powers of enforcement, public participation, formulating management plans, regulation of activities in accordance with management objectives, and international obligations of the state.⁴³ Some of these matters may already be dealt with in national legislation and a review of existing laws may well be appropriate to identify areas where new laws may be needed more than others.

Finally, and perhaps most importantly, the bodies responsible for managing the reserves must be assured adequate financial support, equipment and qualified personnel to monitor and regulate the enclave.⁴⁴ The issues of inadequate resources, problems of

⁴¹ Kelleher, *supra* n. 38 at 13.

⁴² *Ibid* at 12.

⁴³ Salm, *supra* n. 18 at 153-7.

⁴⁴ R. Primack, *Essentials of Conservation Biology* (Sinauer) (2002) at 495.

retaining personnel and lack of capacity to enforce park rules, will be encountered on a number of occasions in the following chapters. This may not be such a big surprise given that it is principally developing states that are endowed with coral reefs,⁴⁵ coupled to the high running costs of MPAs. On the latter point, in 2004 it was estimated that the desired network of MPAs covering 30% of the sea would cost between US\$18.8 billion and US\$6.9 billion.⁴⁶

3.2 APPROPRIATE BOUNDARIES

Setting the boundaries of an MPA is an important issue and Kelleher lists many related factors which can impact upon the success of a reserve such as (a) ensuring the area of the park is large enough to protect enough habitat, and critical areas, to maintain ecosystem processes – thus the range of fish species might be important, (b) ensuring enforcement is possible given the area to be policed, and (c) allowing for the needs of local communities given their dependence upon the sea for their livelihood.⁴⁷ Further, planners should remember that habitats are often inter-linked and thus boundaries may need to cover a variety of ecosystems. As has already been pointed out, sea grass beds, mangroves and lagoons all play their parts in maintaining the coral reef ecosystem and their inclusion within MPAs should be considered.⁴⁸

MPAs may be sub-divided into various zones in order to control different uses – known as multiple use MPAs. Such sectors may include a central sanctuary area (a no take zone) large enough to ensure that surrounding areas are replenished with coral larvae or

⁴⁵ See Appendix I.

⁴⁶ A. Balmford *et al*, “The worldwide costs of marine protected areas” [2004] 101 (26) *PNAS* 9694 at 9696.

⁴⁷ Kelleher, *supra* n. 38 at 40-41.

⁴⁸ *Supra* chapter 3 at 41.

fish.⁴⁹ Other zones may then permit tourist activity, fishing with traditional gear or full scale commercial fishing. Notable examples of such MPAs can be found in the Great Barrier Reef Marine Park in Australia⁵⁰ and the Soufriere Marine Park Management Area in St Lucia.⁵¹ Consideration should therefore be given to establishing such multiple use parks given their ability to meet the needs of various stakeholders who depend upon coral reef ecosystems.

3.3 PUBLIC PARTICIPATION

Given that limiting previously unrestricted activities is an inherent part of operating an MPA, managing the social impacts of conservation should not be overlooked, not least because if such impacts are ignored, the running of a reserve can become much harder. As Alcala *et al* observe, the benefits of fish populations spilling out from no-take reserves can be achieved by both government run and community-based reserves, but the latter will not have so many conflicts with local residents, thus reducing the costs of enforcement measures.⁵² Such public support can be generated through education initiatives, consultation and management roles. An example helps to illustrate these initiatives.

In Kenya, the Kisite Marine National Park is a no-take fishing zone but open to visitors, 32,952 of whom visited in 1991, generating revenue of £83,500 for the Kenyan

⁴⁹ See for example, Roberts, *supra* n. 30.

⁵⁰ Wilkinson, *supra* n. 11 at 27-28.

⁵¹ Spalding, *supra* n. 3 at 71.

⁵² A. Alcala *et al.*, "Collaborative and community-based conservation of coral reefs, with reference to marine reserves in the Philippines" in I. Côté and J. Reynolds (eds), *Coral Reef Conservation* (CUP) (2006) 392 at 401-403.

Wildlife Service and local businesses.⁵³ Nevertheless, this still led to conflict with local communities who were dependent upon fishing for income and food, but who were receiving no additional benefits from the increase in visitors to the park. Matters improved, however, when reform of the wildlife service in 1989 led to improved enforcement of fishing bans⁵⁴ and a community sharing scheme began funding road improvements, schools and clinics.⁵⁵ Support for the park increased further as local fishermen enjoyed increased yields from neighbouring waters to the park.⁵⁶ This engagement with local communities, coupled with improved enforcement efforts has resulted in Kisite being one of the more successful marine parks in Kenya⁵⁷ but also demonstrates how non-community run reserves are more susceptible to enforcement problems in the absence of greater collaboration with local people.⁵⁸

The important lesson from this and other case studies seems to be that engendering enthusiasm for MPAs with stake holders can be beneficial for implementation, enforcement and meeting MPA management objectives.

3.4 INTEGRATED COASTAL ZONE MANAGEMENT

In relation to coral reefs, this thesis has already noted how many anthropogenic threats originate from terrestrial points, notably sedimentation and pollution from

⁵³ M. Watson and R. F. G. Ormond, "Effect of an artisanal fishery on the fish and urchin populations of a Kenyan coral reef" (1994) 109 *Mar. Ecol. Prog. Ser.* 115 at 116.

⁵⁴ *Ibid* at 126.

⁵⁵ T. Austin *et al*, *The Exploitation of Coral Reefs* (Field Studies Council) (1996) at 34.

⁵⁶ *Ibid* and see Watson and Ormond for increases in fish biomass, *supra* n. 53 at 125.

⁵⁷ For a further example on the benefits of public participation, this time in Samoa, see M. King and U. Faasili, "A network of small, community owned village fish reserves in Samoa" (1998) 8(2) *Parks* 11 at 11.

⁵⁸ See generally Alcala, *supra* n. 52.

development, agriculture and land clearance. Such sources of harm therefore lie outside of the control of MPAs, and their regulation may well be the subject of other strategies operated by other agencies or ministries. Yet the impacts of failures on the part of these actors to regulate these anthropogenic threats will be felt within the boundaries of the protected area, potentially de-railing conservation efforts therein.

It is therefore inappropriate for different agencies to operate in isolation, whether that is agricultural ministries regulating the intensity of farming in the catchments for rivers which discharge close to sensitive marine habitats, or environmental ministries declaring no-take zones which will have an impact upon local fishing industries. As was mentioned earlier in this chapter,⁵⁹ ICZM strategies are being advocated as a means to co-ordinate within an over-arching framework the different actors and agencies involved with coastal conservation. ICZM is therefore aimed toward the sustainable development of economic and social activities in the coastal zone whilst still protecting the environment of the same area.⁶⁰ MPAs are one such strategy for achieving this aim, with a particular aptitude for controlling coastal resource management, such as tourist access and fisheries. Nevertheless, in adopting MPA strategies, it is important to integrate such reserves within ICZM frameworks so that they sit alongside and can at least influence or shape other coastal conservation strategies such as environmental impact assessment for urban or tourist development,⁶¹

⁵⁹ *Supra* at 45.

⁶⁰ Agenda 21, *supra* n. 13.

⁶¹ *Supra* at 45.

or devising zoning systems for land use in the coastal area.⁶² In this way, potentially undermining effects of land-use upon MPA management objectives can be avoided.

4. SUMMARY

Coral reef ecosystems are confronted by a range of anthropogenic threats calling for a response from a variety of conservation strategies. Setting aside a geographically defined area of the sea which is designated or regulated and managed to achieve specific conservation objectives is just one such strategy, albeit the strategy this study is concerned with. This chapter has therefore sought to emphasis the position of such MPAs within the broader agenda whilst also giving an indication of the variety of issues which need to be considered in establishing such enclaves in order to create an effectively managed park, rather than one which simply exists on paper. Given this wider understanding of MPAs and best practices in their establishment and operation, it is now possible to embark upon an analysis of the way in which international law promotes their use for the conservation of coral reef ecosystems.

⁶² Whilst this study has already discussed multi-use zones within MPAs, this approach can equally be used for land use in coastal areas, either at wide spatial scales such as designating land for agricultural, tourist or industrial use, or small spatial scales such as dividing a beach; R. Kay and J. Alder, *Coastal Planning and Management* (Spon Press) (2000) at 121.

PART III

THE ROLE OF INTERNATIONAL LAW

CHAPTER FIVE – INTERNATIONAL LAW :

AN INTRODUCTION TO THE CORE OF THIS STUDY

1. INTRODUCTION

In this the substantive part of the study, the ways in which the conservation of coral reef ecosystems through marine protected area strategies (“MPA”) is promoted by international environmental law will be explored. As the discussion therefore moves from the previous scientific survey onto legal matters, this juncture demands that some more general issues be considered as a natural lead-in to that analysis. For example, how can the intervention of international law in the promotion of MPA strategies for coral reef conservation be justified? What benefits can legal action at this level offer? Further, it will be important to remember what this study is seeking to contribute, as well as what its limits are.

2. JUSTIFYING THE INVOLVEMENT OF THE INTERNATIONAL COMMUNITY

It might be thought surprising to encounter a body of international law which addresses the conservation of coral reef habitat at all. This is because, as Dimitrov states, “*scientists and environmental activists alike perceive the problem as primarily local in character*”.¹ Such a perspective has certainly been borne out by the earlier

¹ R. S. Dimitrov, “Confronting Nonregimes: Science and International Coral Reef Policy” (2002) 11(1) *Journal of Environment & Development* 53 at 71. Dimitrov’s arguments involve a number of key assertions. Of importance is his belief that there are no disputes as to the problems being faced by coral reefs, and that there are no political actors who oppose environmental action. Nevertheless, no scientific evidence as to the impacts for humans from coral reef degradation has yet been provided, particularly as to any cross border negative consequences. He therefore believes this latter situation lies at the heart of the lack of a regime in international law for the conservation of coral reefs. As Dimitrov asserts “*A basic premise of regime theory is that international policy regimes are collective responses*

consideration of the marine biology of corals and coral reef ecosystems, where it was noted that the anthropogenic threats facing these ecosystems were primarily localised in origin and effect. This being so, orthodoxy might suggest that the permanent sovereignty of states over natural resources would provide a basis for excluding the international community from what could be claimed to be purely a domestic matter. How, then, can the involvement of the international community in the conservation of coral reef ecosystems through the designation of MPAs be accounted for or justified?

The answer is that the concept of “common concern” of mankind (or humankind) provides the main theoretical basis for such action. Historically this notion, however expressed, has had its own distinct meaning and is not to be confused with related concepts such as “common property” or the “common heritage of mankind” which may equally provide a justification for international involvement in other environmental affairs. This thesis must, therefore, define these latter terms in order to distinguish the common concern of mankind/humankind.

Common property refers to something which is not subject to the sovereign control of any one state. Thus it may be used in two instances. First, it describes those areas which lie outside of sovereign territory and to which all states have access, e.g. the High Seas. Second, common property also describes the resources to be found in these areas such as fish or fur seals. As these resources are found outside of sovereign

to transnational problems that cannot be managed effectively in a unilateral manner.” (at 74-75) However, his stance does not sit happily with existing international action undertaken because of the common concern of mankind, nor with the existence of the conventions noted by M. G. Davidson, “Protecting Coral Reefs: the Principal National and International Legal Instruments” (2002) 26 *Harv. Envtl. L. Rev.* 499, UNEP/WWF, *Conventions and Coral Reefs* (2003) available online at www.unep.org, and this writer which, whilst not focused solely upon coral reefs, do provide for the conservation of these habitats.

territories, states are free to exploit them within the modest confines of international law.²

Occasionally, however, the global community has come to the view that certain natural resources should not be open to exploitation by states simply on account of the fact that those states have the requisite money and expertise to utilise them. These resources are then thought to be the common heritage of mankind. Birnie and Boyle note two occasions when this concept has been deployed, namely the 1979 Moon Treaty and the 1982 United Nations Convention on the Law of the Sea.³ In particular, under the latter convention, and in order to reflect this principle and independently manage the mineral resources therein, the International Sea Bed Authority was established to control the allocation of these exploitation rights and to bring about the sharing of benefits arising from such activities.⁴

The common concern of mankind differs from these two notions in that the state retains sovereignty over the habitat or species located in their territory. What the concept does involve, however, is a partial fettering of that sovereignty through a legitimisation of international interest in that resource – a sense of standing, to use Boyle's term⁵ – balanced by a common responsibility to assist states in utilising those

² P. Birnie and A. Boyle, *International Law and the Environment*, (OUP) (2002, 2nd Ed.) at 139-141. Unfortunately, the freedom to take such natural resources has itself led to problems of over-exploitation – an issue outside of the scope of this study

³ *Ibid* at 143. For the text of the 1979 Moon Treaty see (1979) 18 *ILM* 1434 and for the 1982 UN Convention on the Law of the Sea see (1982) 21 *ILM* 1245.

⁴ United Nations Convention on the Law of the Sea, Part XI, *ibid*.

⁵ A. Boyle, "The Rio Convention on Biological Diversity" in Bowman and Redgwell (eds), *International Law and the Conservation of Biological Diversity* (Kluwer) (1996) at 40.

habitats and species in a sustainable manner.⁶ Birnie and Boyle have clarified the essence of this standing:

What gives such obligations a real *erga omnes* character is not that all states have standing before the ICJ in the event of breach, but that the international community can hold individual states accountable for compliance with their obligations through institutions such as the Conference of the Parties...⁷

Recognition of this principle may have first been expressly given in the climate change and biodiversity conventions which arose out of the 1992 Rio Earth Summit negotiations,⁸ but its existence underpins earlier wildlife and habitat protection treaties.⁹ These are the same treaties which form the basis of the body of law which it will be recognised contribute to the conservation of coral reefs through MPA strategies.

These conventions therefore serve to illuminate how the international community justifies global action in relation to habitats, species and biodiversity when such natural resources amount to sovereign property and where cross-border problems may not be an issue.

⁶ Birnie & Boyle, *supra* n. 2 at 99.

⁷ *Ibid* at 100.

⁸ The preamble to the latter affirms “*that the conservation of biological diversity is a common concern of humankind.*” See further, Chapter 7.

⁹ Birnie & Boyle, *supra* n. 2 at 97.

3. THE BENEFITS OF INVOLVING THE INTERNATIONAL COMMUNITY

Whilst the involvement of the international community in what would otherwise appear to be a domestic matter might be justifiable, it is also worth remembering how international environmental law can enhance the conservation of particular ecosystems. For coral reefs, the nature of these benefits can be viewed as relating to mobilising support and assistance from around the globe, reinforcing the status of a site and exposing the running of a site or national environmental programme to international scrutiny.

3.1 MOBILISING SUPPORT AND ASSISTANCE

As has been touched upon earlier, the common concern of mankind principle maintains that certain habitats are the common responsibility of all states. This responsibility calls upon states to provide assistance to each other in order to advance conservation objectives and as such is one advantage of international legal arrangements. Such assistance may take many forms, including financial help, making new technologies available on favourable terms, or linking stakeholders across national divides in order to share knowledge, experiences and information on best practices in running MPAs. Examples of this will be encountered in this study, particularly in the later discussion on the 1971 World Heritage Convention.¹⁰

3.2 REINFORCING THE STATUS OF A NATURAL AREA

International law can reinforce the status of an MPA, perhaps most obviously through the formal recognition of the importance of a natural area. Such recognition is commonly achieved through listing or inventory mechanisms, as demonstrated by

¹⁰ See Chapter 9.

both the World Heritage Convention¹¹ and the Ramsar Convention,¹² and as is currently being considered for introduction under the Indian Ocean memorandum of understanding on species of marine turtles, in order to help with efforts to “*promote greater awareness and recognition*” of sites of special importance.¹³

Thereafter the recognition international law accords to a protected area may result in a number of advantages which can in turn promote improved management of the site. For example, recognition may have the knock-on effect of promoting or reinforcing the attraction of a site as a tourist destination. This can lead to increased revenues which, if channelled back into the operation and management of the site, can increase the chances of achieving conservation objectives.

International recognition may also improve management standards through reinforcing the importance of a site at national governmental level. With a site exposed to scrutiny from other national and international observers, environmental ministries can make stronger representations on behalf of such protected areas when threatened by initiatives in other government departments, or in requesting state funding for management programmes in such enclaves. For example, in development-versus-nature-protection debates, international listing and recognition of a natural area may tip the balance in favour of protection, particularly if it might expose the government to comment from the international community in public forums such as meetings of contracting parties.

¹¹ *Ibid.*

¹² See Chapter 8.

¹³ *Proposal for a Site Network Linked to the MOU*, 6th February 2004 (MT-IOSEA/SS.2/Doc.11.2), and see in general Chapter 10.

3.3 THE SCRUTINY OF THE INTERNATIONAL COMMUNITY

International law offers various means for reinforcing management objectives within MPAs, as has already been touched upon above, based upon the accountability of one state to all others under international environmental law and the exposure of state action to scrutiny by the international community and the wider public. Such exposure might be achieved through the production of inventories of protected areas (see above), but more often relies upon reporting mechanisms under treaty regimes which help states, non-governmental organisations, inter-governmental organisations, academics and members of the public to assess the extent to which contracting parties are meeting their commitments and conserving those habitats in which the international community as a whole has a concern. Conferences of the parties, smaller working groups and information reports of secretariats also play a role in influencing national conservation efforts in this way. Whilst recourse to tribunals might not therefore be a desirable or realistic means to ensure that environmental obligations are met, other more subtle mechanisms used in international environmental law can still promote compliance with conservation commitments.¹⁴

As will be noted in the following chapters, these features of international environmental law might not result in more protected areas being designated, but they can lead to improved standards of management within those that already exist, thus tackling the problem of ‘paper parks’.

¹⁴ Lyster aptly describes these mechanisms as being important to “*keep parties on their toes and to make them feel that they will be publicly castigated if they do not comply with the terms of the treaty*”, S. Lyster, *International Wildlife Law* (CUP) (1985) at 130.

4. INITIATIVES BEYOND THIS STUDY'S BOUNDARIES

In the light of the above, and recalling earlier chapters which highlighted the benefits derived from coral reef ecosystems and their degradation by humans, the merits of an extended discourse into international legal action and the promotion of MPAs for the conservation of these habitats become clearer. Such a study should also be welcomed since academic comment and analysis in this area is scant, with no treatise having yet been completed. That said, limited recognition has already been given to the existence of international laws which relate to protected areas and also to coral reef ecosystem conservation. In its recent publication *Conventions and Coral Reefs*,¹⁵ the United Nations Environment Programme ("UNEP") provided a very brief summary of the contribution of nine conventions and five non-binding initiatives towards conserving coral reefs through (variously) addressing pollution, trade, climate change and habitat protection. Before this in 2002, Mary Davidson reviewed a select number of conventions and their implementation in the US in order to assess their contribution to coral reef conservation.¹⁶ Finally, the World Conservation Union ("IUCN") Environmental Law Centre investigated a possible international legal regime for protected areas in 2003, although without reference to any particular habitat.¹⁷ With these publications each having their own limitations, this study breaks new ground through a linked analysis of MPA strategies and the conservation of coral reef

¹⁵ UNEP/WWF, *supra* n. 1.

¹⁶ Davidson, *supra* n. 1. Unfortunately, Davidson overlooked the 1971 Convention on Wetlands of International Importance Especially As Waterfowl Habitat. However, an analysis of the role this convention plays has since been published by the author of this study; see E. J. Goodwin, "Conservation of Coral Reefs Under the Ramsar Convention on Wetlands" (2006) 9(1) *JIWLP* 1.

¹⁷ J. Scanlon and F. Burhenne-Guilmin, *International Environmental Governance – An International Legal Regime for Protected Areas* (2003), paper prepared for Parks Canada in advance of the Vth IUCN World Parks Congress, Durban, South Africa.

ecosystems. Further, this thesis is an opportunity to consider such issues in a level of detail not yet attempted.

Whilst the above serves to stress the projected contribution of this study, a number of topics and conventions do not necessarily fall within its range. Details of these matters will be mentioned at this stage in order to understand their relationship, and limited relevance, to this study.

4.1 REGIONAL CONVENTIONS

Multilateral environmental agreements can be found operating at the regional, as well as the global, level. Such regional agreements amount to a substantial body of law, yet their relevance to this study is limited. Indeed as will be seen, these arrangements are only discussed in this work to the extent that they relate to the operation of a global treaty, such as the various regional seas programmes envisioned under the United Nations Convention on the Law of the Sea, and the agreements concluded under the auspices of the Convention on Migratory Species. A variety of justifications can be advanced to support the approach adopted.

4.1.1 *Limited Application*

First, some of the more successful and active regional agreements simply do not incorporate significant areas of coral reef within their operation. This is demonstrated by the 1979 Convention on the Conservation of European Wildlife and Natural Habitats (the “Berne Convention”).¹⁸ The Berne Convention was negotiated and agreed under the auspices of the Council of Europe and the early signatories to the convention were member states of this body. More recently, Eastern European and

¹⁸ 56 UKTS (1982). In force 1 June 1982.

African states have also become contracting parties. Membership of the Berne Convention by states having jurisdiction over coral reef areas is, however, still quite limited and remains restricted to France, the UK and the Netherlands.

More fundamentally, the application of the Berne Convention may be restricted in that it can be argued that the agreement is not intended to conserve coral reef ecosystems. This is because there are strong grounds for interpreting the treaty as being limited to species which have some connection to the European Continent.¹⁹ This seems most readily apparent from the title of the convention, but other grounds can also be recognised.

First, under Article 4, countries must take steps to conserve the habitat of species listed in Appendices I-III yet a reading of these parts of the convention reveals not only the omission of reef building corals, but also a deliberate focus upon European species or on European populations of particular species.²⁰ For example, the application of the treaty to certain species of sponge is limited to Mediterranean populations.

Second, it has been pointed out by Sand that African states were only encouraged to become parties to the convention on account of their importance to migratory species which visit European countries, and the presence of habitats in those countries which were similar to those found in Europe.²¹

¹⁹ Lyster, *supra* n. 14 at 149.

²⁰ Indeed, it is notable that coral reef habitats were also not referred to by the convention's standing committee in the maritime section of Resolution No. 4 (1996) on *Listing Endangered Natural Habitat Requiring Specific Conservation Measures*.

²¹ P. H. Sand (ed.), *The Effectiveness of International Environmental Agreements* (Grotius) (1992) at 9.

Finally, support for the assertion that the species to be conserved under the treaty must have a connection to the European Continent can be found in the *Explanatory Report Concerning the Convention on the Conservation of European Wildlife* which, as Lyster recounts,²² records the discussions of the expert committee which drafted the convention. These notes were authorised for publication by the Committee of Ministers to the Council of Europe in 1979. The report records that certain species and their habitat might find protection under the convention's provisions wherever they are located in the world, but only because:

many species of flora and fauna *of Europe* are found outside Europe;

[emphasis added]²³

If this interpretation of the convention is correct, the conservation obligations would not catch corals nor reef ecosystems on account of the absence of reef building corals in marine waters around the European continent.

All of this, when taken together with the small number of coral reef nations which are contracting parties to the treaty,²⁴ leads to the conclusion that the Berne Convention is of limited relevance to this study.

4.1.2 *Sleeping and Outdated Agreements*

A number of the regional agreements which do cover greater areas of coral reef suffer from a lack of commitment from contracting parties to continue pursuing objectives. The reasons for this arise out of subsequent developments in International

²² Lyster, *supra* n. 14 at 132 (fn. 8).

²³ Paragraph 17(1) quoted in Lyster, *ibid* at 148.

²⁴ It should also be noted that at the time of approving the Berne Convention, the Netherlands agreed that it would only apply in relation to its kingdom in Europe.

Environmental Law which have dated the provisions of the older agreements, and shortcomings in the institutional arrangements agreed upon for the treaties. Two examples seem particularly pertinent to this study.

The 1940 Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere²⁵ enjoys the participation of 11 coral reef states.²⁶ Protection of habitat through protected areas plays an important role in pursuing the Convention's objectives. However, Sands notes:

The great weakness of the Convention is the absence of any institutions to oversee and ensure its implementation.²⁷

This problem has been compounded by its terms becoming dated in the light of modern approaches involving reporting mechanisms, sustainable development, the wider focus on biodiversity, and catering for differing degrees of development within state parties.²⁸ As a result, the agreement is largely ignored by its contracting parties;²⁹ or, to use Lyster's phrase, it has become a sleeping treaty.³⁰

A similar picture can be painted of the 1976 Convention on Conservation of Nature in the South Pacific (the "Apia Convention"), even though recent efforts have been made to revitalise its operation.³¹ Five states have ratified or acceded to the

²⁵ 161 UNTS 193.

²⁶ Brazil, Costa Rica, Dominican Republic, Ecuador, Mexico, Haiti, Nicaragua, Panama, Trinidad and Tobago, the USA and Venezuela.

²⁷ P. Sands, *Principles of International Environmental Law* (CUP) (2003, 2nd Ed.) at 528.

²⁸ Sand, *supra* n. 21 at 60.

²⁹ Sands, *supra* n. 27 at 529 and see Sand, *ibid* at 60 on the drafting of national laws without reference to the convention.

³⁰ Lyster, *supra* n. 14 at 98.

³¹ IELMT 976:45. In force 26 June 1990.

agreement, all of which have jurisdiction over coral reefs. These states are Australia, the Cook Islands, Fiji, France and Samoa.³² Like the Western Hemisphere Convention, it too places particular reliance upon protected area strategies for controlling commercial activities and the taking of wildlife. However, despite the potential impact the Apia Convention could have on a study concerned with MPA strategies and conserving areas of coral reef habitat, the commitment of the parties to the treaty's continued operation has been waning in the last few years.

Evidence of this weakening support comes from a couple of sources. Whilst the convention did not provide for formal meetings, the contracting parties appear to have periodically gathered together and some records of these conferences exist.³³ This is supplemented by reports on implementation of the convention which have been presented to meetings of the South Pacific Regional Environment Programme ("SPREP"). Such reporting became possible following the transfer of secretariat functions from the South Pacific Commission to the latter body.

Over time, the approach of the Apia Convention has become dated, particularly following the entry into force of the 1992 Convention on Biological Diversity ("CBD")³⁴ and the development of protocols on protected areas, such as the 1990 Protocol Concerning Specially Protected Areas and Wildlife to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region.³⁵ Various ways of overcoming this problem were mooted within

³² Papua New Guinea was a signatory to the original convention but has not proceeded to ratification.

³³ See the incomplete records available through www.sprep.org.ws.

³⁴ 31 *ILM* 818.

³⁵ Introduction to the *Draft Protocol [on the Protection of Natural Resources] [Concerning Specially Protected Areas and Wildlife] [Concerning Specially Protected Areas and Wild Fauna and Flora] in the South Pacific Region – First Draft March 2002* available at www.sprep.org.ws.

SPREP, such as amending the treaty or (and this was favoured) negotiating a new agreement. Indeed, at the 13th SPREP Meeting held in the Marshall Islands in July 2002, estimates for an initial workshop to look at a replacement convention were provided and put at US\$130,000, with Australia suggesting that the full costs of negotiating such an instrument after further meetings would be around US\$500,000.³⁶ Nevertheless, the following year, and with funding for such negotiations apparently a problem, Australia suggested that SPREP would better focus its efforts on helping countries meet their commitments under the CBD.³⁷ This position found support from Niue who noted that most Pacific island countries were party to the CBD which in its application was more relevant at that time.³⁸

The commitment to this renegotiation appears to be floundering with France expressing agreement with Australia that for reasons of cost, and the existence of new MEAs concluded since 1976, there is no need to conduct such an exercise.³⁹ Despite some re-invigoration following the appointment of the SPREP, the importance of the Apia Convention therefore appears to be waning with two key contracting parties failing to support change and opinion amongst potential members in the region suggesting the future lies in action under the CBD.

4.1.3 Not Yet in Force

The final basis for the limited coverage afforded to regional conventions in this thesis is that some have yet to enter into force. This is the case for the 1985 Association

³⁶ 13th SPREP Meeting Report, para 85.

³⁷ 14th SPREP Meeting Report, para 157.

³⁸ *Ibid* at para 158. Niue is a member of SPREP but a non-contracting party to the Apia Convention.

³⁹ Report of the 7th Ordinary Meeting of the Contracting Parties to the Convention on the Conservation of Nature in the South Pacific, 10 September 2004, at 6.1.1.

Southeast Asian Nations (“ASEAN”) Agreement on the Conservation of Nature and Natural Resources⁴⁰ and the 2003 African Convention on the Conservation of Nature and Natural Resources.⁴¹ The latter treaty has recently been concluded in order to replace and update the earlier 1968 convention of the same name,⁴² and demonstrates what could be achieved for the South Pacific region if the political will existed for modernising the Apia Convention. Nevertheless, the 2003 African Convention will require 15 ratifications before it can enter into force.

The likelihood of the ASEAN convention entering into force, however, seems more remote. The agreement has been rightly lauded for its detail and the stress placed upon sustainable development.⁴³ However, the convention has failed to attract the required six ratifications from amongst the ASEAN member states. Only three countries have proceeded to ratify the agreement (Indonesia, the Philippines and Thailand), all of whom did so in the year following the convention’s conclusion. 20 years have therefore passed with no indication that further countries are willing to ratify the agreement.

The limited consideration of regional conventions in this study is therefore justified for the reasons stated. However, there are also certain initiatives which do not fall within the range of this thesis for other reasons. These are considered next.

⁴⁰ 15 EPL 64

⁴¹ Text and a commentary on the new convention can be found in IUCN, *An Introduction to the African Convention on the Conservation of Nature and Natural Resources – IUCN Environmental Policy and Law Paper No. 56* (2004).

⁴² 1001 UNTS 4.

⁴³ Sand, *supra* n. 21 at 113 and Sands, *supra* n. 27 at 541.

4.2 VOLUNTARY INITIATIVES

At the outset, this thesis has emphasised its concern with legally binding MEAs. The following chapters reflect this limitation, however it is worth emphasising at this stage that a number of organisations and non-binding initiatives also exist which promote the conservation of coral reef ecosystems, sometimes through MPA strategies. Two of these strategies have a small bearing upon this thesis' ultimate conclusions and therefore, whilst not belonging to the body of international law strictly so called, at least merit an introduction in this chapter.

4.2.1 UNESCO's *Man and the Biosphere Programme*

In 1971, the United Nations Educational, Scientific and Cultural Organization ("UNESCO") launched the Man and the Biosphere Programme ("MAB").⁴⁴ One of the MAB's principal objectives is to set up a global network of Biosphere Reserves. These reserves are to be managed in a way which balances the relationship between conserving biological diversity and allowing for its sustainable use. To this end, the deployment of zoning within the reserves to reflect different levels of protection and exploitation is encouraged. Comparative studies can then be conducted between these zones on the state of the habitats within the reserve.

Biosphere reserves are nominated by states for inclusion in the global network, and may cover terrestrial and marine areas. To date, 482 biosphere reserves have been designated, of which 25 contain coral reefs.⁴⁵ Two of these reserves (Komodo and

⁴⁴ For a general overview of the MAB programme, see B. Salvat *et al.*, *Coral Reef Protected Areas in International Instruments* (CRIOBE-EPHE) (2002) at 63-66.

⁴⁵ These sites are: Seaflower and Ciénaga Grande de Santa Marta (Colombia); Cuchillas del Toa, Península de Guanahacabibes, Ciénaga de Zapata and Buenavista (Cuba); Jaragua-Bahoruco-Enriquillo (Dominican Republic); Atoll de Taiaro and Archipel de la Guadeloupe (France); Gulf of

Sian Ka'an) have also been inscribed onto the World Heritage List under the World Heritage Convention, whilst a further two (Ciénaga de Zapata and Archipel de la Guadeloupe) have been listed as Wetlands of International Importance under the Ramsar Convention.

This brief overview therefore serves to highlight how the MAB programme exists as an important, albeit non-legally binding, global initiative for the promotion of MPA strategies for the conservation of coral reef ecosystems. The use of various zones within the reserves supports the objectives of the programme, as well as some of the best practices for setting up MPAs which were encountered in Part II of this study. In addition, and as an indication of progress towards helping these habitats, the number of Biosphere Reserves containing coral reefs is also broadly comparable to those which have been nominated under the Multi-lateral Environmental Agreements ("MEA") covered later in this study. Recourse to the programme may therefore be appropriate for some states seeking to further the conservation of these habitats, although as has been indicated above, this need not be to the exclusion of the MEAs considered in later chapters.

4.2.2 The Biodiversity Liaison Group

Informal inter-governmental initiatives exist which support the international legal system through co-ordinating various aspects of coral reef conservation and MPA strategies. For example, the International Coral Reef Initiative was established in the mid-1990's as an attempt to share information on the health of coral reefs and to

Mannar (India); Siberut and Komodo (Indonesia); Kiunga and Malindi-Watamu (Kenya); Mananara-Nord, Sahamalaza-Iles Radama and Littoral de Toliara (Madagascar); Sian Ka'an and Banco Chinchorro (Mexico); Utwe (Micronesia); La Amistad (Panama); Puerto Galera and Palawan (Philippines); Virgin Islands and Everglades & Dry Tortugas (USA). Data from www.unesco.org and updated by the author.

mobilise governments and other stakeholders in order to improve management practices, and increase capacity and political support.

Of particular interest to this study is one group which has been created in order to improve co-operation and co-ordination between the principal biodiversity MEAs. In June 2004, Executive Secretaries and high level representatives from the CBD, Ramsar, the World Heritage Convention, the Convention on Migratory Species and the Convention on International Trade in Endangered Species, attended the first meeting of (what has become known as) the Biodiversity Liaison Group (“BLG”). This meeting was organised by the CBD in response to a decision, made by the contracting parties under that convention,⁴⁶ urging the formation of a liaison group to enhance co-operation and coherence between the biodiversity related conventions. Three further meetings have since taken place.

Initially, the BLG focused its work around the 2010 targets set under the CBD in the light of the broad support for that convention from states, and the targets’ compatibility with the outcomes of the World Summit on Sustainable Development. The BLG considered the ways in which all of the conventions could contribute towards achieving these goals, and how they could monitor and share data on progress through their compliance mechanisms. In addition to this work, the BLG has also sought to raise the profile of its activities and objectives through making addresses to, conducting side events at, and having representation at, the Conferences of the Parties of the respective conventions.

Whilst the BLG is a recent creation, the significance of this co-ordinating group will become more apparent as this study progresses, particularly as the potential overlap

⁴⁶ CBD Decision VII/26.

between MEAs becomes more apparent. Additionally, the growing recognition within the BLG that there needs to be further development in its work plans covering the period following 2010, will be seen as a potential opportunity for the benefit of coral reef ecosystem conservation through MPA strategies.

5. SUMMARY

Whilst multilateral action in environmental matters may be needed to resolve a problem which has transboundary effects – such as acid rain or climate change – in the author's view this is not a prerequisite to such steps being taken. This chapter has sought to establish this point, through discussion of the common concern of mankind principle. It has been suggested that lack of scientific evidence of transboundary impacts need be no bar to the international community agreeing and implementing international laws to promote the conservation of coral reef ecosystems.

States endowed with these ecosystems may therefore have to accept the standing of other nations through the common concern of mankind principle, and the right of those nations to watch and speak out about coral reef states' conservation activities. Nevertheless, the involvement of the international community and international law can also bring benefits such as mobilising support and assistance, promoting a particular site, and strengthening the environmental lobby's hand at the national level as national executives formulate policies and budgets. Therefore, subject to the limits discussed in the second half of the chapter where it was highlighted how many regional agreements were not particularly relevant to this study and also that this thesis would not look at non-law initiatives, it is now time to proceed to analysis the various treaties which could, and often do, promote the conservation of coral reef ecosystems through MPA strategies.

CHAPTER SIX – THE LAW OF THE SEA CONVENTION

AND THE REGIONAL SEAS AGREEMENTS

1. INTRODUCTION

This chapter will focus upon the promotion of MPA strategies for the conservation of coral reef ecosystems as provided for in the provisions of the 1982 United Nations Convention on the Law of the Sea¹ (usually referred to as the Law of the Sea Convention and hereafter the “LOSC”). As will be seen, the LOSC has a limited role in promoting the conservation of coral reefs through MPA strategies, with its main impact perhaps lying in its regulation of the powers of states to create MPAs in their maritime zones. The regional seas agreements applicable to maritime areas in which coral reefs naturally occur will then be analysed. The reasons for considering both the regional agreements and the LOSC in the same chapter stems from the latter’s advocacy under Article 197 of regional approaches for tackling environmental protection, and these agreements’ traditional association with those rules of international law which are collectively regarded as the law of the sea.²

¹ 21 ILM 1245 (1982).

² The ‘law of the sea’ can be defined as all those rules and principles of international law “*that bind States in their international relations concerning maritime matters*” - R. R. Churchill and A. V. Lowe, *The Law of the Sea* (Manchester University Press) (1999, 3rd Ed.), at 1. Defined in this way, the law of the sea parallels, and to some extent overlaps with, the definition of international environmental law. For example, Birnie and Boyle conceive of the latter term being “*a convenient way to encompass the entire corpus of international law, public and private, relevant to environmental issues or problems, in the same way that use of the terms “Law of the Sea”... is widely accepted*”. P. Birnie and A. Boyle, *International Law and the Environment* (OUP) (2002, 2nd Ed.), at 1-2

2. THE 1982 UNITED NATIONS CONVENTION ON THE LAW OF THE SEA

The LOSC was opened for signature on 10 December 1982 and was the culmination of nine years work under the auspices of the 3rd United Nations Conference on the Law of the Sea (hereafter “UNCLOS III”) which had been mandated to meet by the UN General Assembly in 1970.

The LOSC was also the last attempt of the 20th Century to codify international customary law relating to the sea. Progress had previously been made in formulating such treaties in the late 1950’s, through the adoption and ultimate entry into force of conventions dealing with the various maritime zones.³ By 1970, a number of events had given rise to a desire to reappraise the existing work, including the emergence of newly independent states who had not been involved in the 1950’s deliberations, and the opening up through advances in technology of the possibility for states to exploit the resources of the deep sea bed.⁴ Of particular interest for this study was the growing desire of coastal states to address, in a detailed and comprehensive manner, issues of pollution and over-fishing near to their coastal waters. As a motivation for reformulating the law of the sea, such environmental issues assumed added significance following the conclusion of the United Nations Conference on the Human Environment held in Stockholm in 1972 and the publication of the conference’s adopted principles and recommendations⁵ shortly before the first

³ These conventions, all adopted in Geneva at the 1st United Nations Conference on the Law of the Sea (UNCLOS I) in 1958, were the Convention on the Territorial Sea and the Contiguous Zone, 516 *UNTS* 205 and hereafter, the “Territorial Sea Convention”, the Convention on the High Seas, 450 *UNTS* 11, the Convention on the Continental Shelf, 499 *UNTS* 311 and the Convention on Fishing and Conservation of the Living Resources of the High Seas, 559 *UNTS* 285.

⁴ See generally Churchill and Lowe, *supra* n. 2 at 13-22.

⁵ (1972) 11 *ILM* 1085.

meeting under UNCLOS III.⁶ This “*rising tide of environmentalism*” therefore impacted upon the negotiations.⁷

The LOSC was intended as a “*comprehensive restatement of almost all aspects of the law of the sea*”⁸ including the conservation of the marine environment. Further, the treaty carefully sought to balance the competing interests of maritime states, who wanted to preserve the freedoms and rights they exercised over the seas and oceans, and those of coastal states, who demanded more powers to regulate activities in the waters close to their shores.

This restatement, as indicated, included much of interest to environmental lawyers. This is immediately apparent in the preamble to the convention, which recognised the desirability of establishing:

a legal order for the seas and oceans which will facilitate communication, and will promote the peaceful uses of the seas and oceans, the equitable and efficient utilization of their resources, the conservation of their living resources, and the study, protection and preservation of the marine environment.

The adopted text therefore included provisions on the design and construction of ships (which it was hoped would have a knock-on effect on reducing pollution following collisions at sea), the management of fisheries outside of coastal states’ territorial waters and marine pollution more generally. Indeed, part XII of the LOSC,

⁶ Report of the Secretary General, *Law of the Sea : Protection and Preservation of the Marine Environment* 18 September 1989, (UN Doc: A/44/461), Part III, para 23-25.

⁷ R. Falk and H Elver, “Comparing Global Perspectives: The 1982 UNCLOS and the 1992 UNCED” in Vidas and Østreng (eds), *Order for the Oceans at the Turn of the Century* (Kluwer) (1999) at 148.

⁸ Birnie and Boyle, *supra* n. 2 at 348.

entitled “*Protection and Preservation of the Marine Environment*”, is focused upon the marine environment and contains many of the core articles of interest to this study.

Consequently, the LOSC and these environmental provisions have been afforded great significance by some academic writers, with Charney describing the LOSC in 1994 as:

the most comprehensive and progressive international environmental law of any modern international agreement. Not only does the Convention successfully address marine environment issues, it serves as a prototype for environmental agreements in other fields.⁹

The role of the LOSC as a model for the evolution of international environmental law had also been espoused in the 1989 report on the law of the sea and the protection of the environment by the UN Secretary General to the General Assembly.¹⁰ In particular, the Secretary General highlighted the LOSC’s contribution to the concept of preventing transboundary pollution, and the completion of environmental impact assessments.¹¹ Generally, much of the claimed status rests upon the detailed pollution provisions, which included some of the first (albeit inadequate) attempts to tackle land-based sources of pollution and moves to enhance enforcement of pollution regulations through affording greater powers to coastal and port states.

However, the merits of the LOSC are not without question. For example, the convention fails to provide for conferences of the parties to periodically review

⁹ J. I. Charney, “The Marine Environment and the 1982 United Nations Convention on the Law of the Sea” (1994) 28(4) *The International Lawyer* 879 at 882.

¹⁰ Report of the Secretary General, *supra* n 6, Part II, E, para 15.

¹¹ *Ibid*, Part II, E, paras 16 and 17.

implementation and progress; a factor which, at least, raises doubts about the convention's suitability to act as a prototype for other Multilateral Environmental Agreements (hereafter "MEAs").¹² In addition, it has been argued that the LOSC fails to reflect the modern focus on sustainable development.¹³ Indeed, Falk and Elver speculate that:

if the negotiations had occurred in the 1990's, then it would seem likely that the language of 'sustainable development' would have been used to clarify the overall approach to environmental protection...¹⁴

Finally, the LOSC has a limited significance for the conservation of coral reef ecosystems through MPAs. This is despite its importance for issues which have an indirect bearing on the health of these ecosystems, such as fisheries management and pollution control. Indeed, even in relation to fisheries and pollution, it is difficult to see how the convention's provisions can even provide any indirect benefit to promoting the use of MPAs for conserving coral reefs. For example, the provisions on fisheries are only applicable within the Exclusive Economic Zone ("EEZ") of a coastal state and in the High Seas. As will be discussed later in this chapter, this may have little impact upon coral reef ecosystems as the EEZ and High Seas are suspected

¹² Falk and Elver, *supra* n. 7 at 148.

¹³ See Birnie and Boyle, *supra* n 2 at 391 to the effect that the LOSC has been less successful, than in other areas, in "*establishing a comprehensive and integrated 'system for sustainable development'*". For an alternative point of view see A. Yankov, "The Law of the Sea Convention and Agenda 21: Marine Environmental Implications" in A. Boyle and D. Freestone (eds), *International Law and Sustainable Development: Past Achievements and Future Challenges* (OUP) (1999) 271, to the effect that Articles 192 and 193 read together are a legal mechanism for balancing environmental concerns and development and as such are therefore forerunners to what later developed into the principle of sustainable development.

¹⁴ Falk and Elver, *supra* n 7 at 148.

to be home to a small proportion of the earth's coral reefs – the majority of which are likely to lie within internal or territorial waters.¹⁵ Further, the detailed provisions on pollution, both vessel-source and land-based, are either of limited significance as a threat to coral reefs (in the case of the former), or, in the latter case, a threat which is beyond the reach of MPAs as a conservation device, given their land-based origin.¹⁶

A selective reading of the LOSC in accordance with the focus of this study on the promotion of MPAs as a strategy for conserving coral reef ecosystems therefore leaves an assortment of provisions far less numerous and precise than those, for example, covering pollution.¹⁷ Ultimately, it is this which leads to a conclusion that

¹⁵ No conclusive data exists on the distribution of coral reefs between the various maritime zones.

¹⁶ See Chapter 3. It has been argued (D. Ong, "The Relationship Between Environmental Damage and Pollution: Marine Oil Pollution Laws in Malaysia and Singapore" in M. J. Bowman and A. Boyle (eds), *Environmental Damage in International and Comparative Law* (OUP) (2002) 191) that the notion of pollution as used in International Environmental Law may be more flexible than one might think; going beyond common perceptions of, for example, oil spill incidents. For instance, Ong suggests (at 194) that the kinetic energy released if a vessel strikes a coral reef arguably leads to such incidents satisfying the Law of the Sea Convention definition of pollution in Article 1(1)(4) which requires the introduction by man of energy into the environment with deleterious effects. If this is so, then a wide range of activities which cause direct physical damage to coral reefs would meet the definition, such as divers breaking off pieces of reef, anchor damage from ships and blast fishing techniques. Nevertheless, and despite the merits of this argument, the approach of the Law of the Sea Convention in practice does not seem to reflect, nor provide it with the tools to deal with, this wider interpretation. Instead the treaty addresses land-based sources of pollution, sea-bed activities, dumping of waste such as radioactive material, discharges from shipping operations, and the mobilisation of international assistance following pollution events (the last being an unlikely response to those situations described above which could 'pollute' the environment with kinetic energy).

¹⁷ R. Lagoni, "Marine Protected Areas in the Exclusive Economic Zone" in A. Kirchner (ed.), *International Maritime Environmental Law – Institutions, Implementation and Innovations* (2003) (Kluwer) (2003) 157 at 160:

Although the concept of the protection and preservation of the sea includes more than merely pollution of the marine environment, most provisions of this Part relate expressly to pollution... Pollution was obviously the principal concern of the States at

the LOSC has a more limited significance for the promotion of MPA strategies for the conservation of coral reef ecosystems. This will become apparent as these articles are considered in turn, starting with those provisions of relevance from Part XII of the LOSC.

2.1 THE PROTECTION AND PRESERVATION OF THE MARINE ENVIRONMENT AND THE CONSERVATION AND MANAGEMENT OF MARINE LIVING RESOURCES

The opening section of Part XII sets out some general provisions, many with a notable focus upon the prevention, reduction and control of pollution. Of these provisions, the following have a bearing upon coral reef ecosystems and their conservation through MPAs.

Article 192 of the LOSC declares that “*states have the obligation to protect and preserve the marine environment.*” This provision is notable for a couple of reasons. First, the obligation is unqualified. It is not framed so as to be performed “as far as possible” or in accordance with a state's capabilities.¹⁸ It obliges states to protect and preserve the global marine environment throughout all of the maritime zones to the same (albeit unknown) degree.

Second, the article is often regarded as a statement of customary international law,¹⁹ and as such is binding as a legal undertaking upon states which are parties to the

the time [of UNCLOS III] with regard to the environmental protection of the sea, and it was an issue on which the Conference could easily reach consensus.

¹⁸ P. Birnie, “The Challenges of Applying UNCLOS in a Post UNCED Context” in J. Norton *et al* (eds), *The Changing World of International Law in the Twenty-First Century* (Kluwer) (1998) 4 at 22;

¹⁹ See for example, report of the Secretary-General, *supra* n 6 at para 29; Birnie, *ibid* at 22; Birnie and Boyle, *supra* n 2 at 351-352.

LOSC, as well as upon non-contracting parties in the absence of persistent objection on their part.

This obligation is followed by Article 193:

States have the sovereign right to exploit their natural resources pursuant to their environmental policies and in accordance with their duty to protect and preserve the marine environment.

Article 193 is significant in recognising the right of states to use their natural resources. That said, the wording towards the end of the provision seems to be a reference to the obligation to protect and preserve the marine environment as expressed in Article 192 and might suggest that the earlier article has priority over the sovereign right of exploitation.²⁰

These two articles, however, lack sufficient detail to provide meaningful guidance to states as to what activities are acceptable under the convention. An attempt to address this is made by the LOSC through the terms of Article 194. The first four parts of this article address pollution which, as was explained earlier, doesn't really get to grips with the principal threats to coral reef ecosystems. Consequently, much of the detail set out in Article 194 is of limited relevance.²¹ However, Article 194(5) states:

The measures taken in accordance with this Part shall include those necessary to protect and preserve rare or fragile ecosystems as well as the habitat of depleted, threatened or endangered species and other forms of marine life.

²⁰ Birnie and Boyle, *supra* n. 2 at 352.

²¹ The article also appears to be more of a general introduction to the far more detailed provisions on pollution control expanded upon in the majority of Part XII's articles.

Interpreting this provision is far from straight-forward. Opinions differ as to whether Article 194(5) emphasises one of the objectives of pollution control,²² or whether it creates a wider obligation to take conservation measures to protect and preserve rare or fragile ecosystems from all threats (i.e. not limited to pollution).²³ This uncertainty stems from inconsistent features of the article. The quoted provision is contained in an article given the heading “*Measures to prevent, reduce and control pollution of the marine environment*”, yet it refers to measures to be taken in accordance with “*this Part*”. This latter wording appears to be a reference to Part XII of the LOSC which, if it is recalled that Articles 192 and 193 fall in this section of the treaty, is not limited to pollution control.²⁴

If the wider interpretation is favoured, then Article 194(5) is of some importance to this study as it can be argued that it draws particular attention to coral reef ecosystems needing protection. This is because, although no particular habitat types are specified, reference is made to “rare or fragile ecosystems”. Coral reefs might well be regarded

²² M. Jeffery, “An International Regime for Protected Areas” in J. Scanlon and F. Burhenne-Guilmin, *International Environmental Governance – An International Legal Regime for Protected Areas* (2003) Section 2 at 18:

marine pollution must be prevented, reduced or controlled in order to “protect and preserve rare or fragile ecosystems as well as the habitat of depleted, threatened or endangered species and other forms of marine life”(Article 194(5))

²³ Lagoni, *supra* n. 17 at 160 with respect to Article 194(5):

The protection of ecosystems and habitats is a goal which has to be distinguished from the prevention of pollution. Accordingly [Art. 194(5)] provides a separate and independent legal obligation, whilst it is systematically included in an article that deals in its sections 1 to 4 with measures to prevent pollution. This obligation to protect ecosystems and habitats relates to all measures taken in accordance with Part XII.

²⁴ For the background on the drafting of this article and the addition of sub-paragraph 5 (albeit inconclusive on the matter), see M. H. Nordquist (ed.), *United Nations Convention on the Law of the Sea: A Commentary*, Volume IV (Martinus Nijhoff) (1991) at 63.

as fragile given the complexity of the relationships which sustain the ecosystem and their vulnerability to a range of threats.

Few of the remaining articles under Part XII are drafted in terms of sufficient generality to be of significance to this study, being aimed principally at the control of pollution. However, it is worth noting that both Article 202, on scientific and technical assistance to developing states, and Article 206, on the assessment of potential effects of activities, have a bearing upon the protection and preservation of marine habitats generally.

Ultimately though, the provisions of Part XII which are of relevance to the focus of this study are both general and imprecise, and have not been developed or monitored further by the contracting parties. The reason for this may well lie in the ultimate form of the LOSC as a hybrid convention, which is at once a framework document providing a constitutional structure for the legal order of the seas, and in other respects a detailed convention on matters such as pollution. Churchill and Lowe therefore characterise the agreement as in places:

an extremely precise, detailed instrument closer in appearance to a commercial contract or concession than to an international treaty... The other parts are more in the nature of a framework treaty or *loi-cadre*, leaving the elaboration of precise rules to other bodies, such as national governments and international organisations, and to dispute settlement procedures or future international negotiations.²⁵

On that latter point, attention should be drawn to Article 197, which supports Churchill and Lowe's observations by providing that:

²⁵ Churchill and Lowe, *supra* n 2 at 18.

States shall cooperate on a global basis, and as appropriate, on a regional basis, directly or through competent international organisations, in formulating and elaborating international rules, standards and recommended practices and procedures consistent with this Convention for the protection and preservation of the marine environment, taking into account characteristic regional features.

It is therefore apparent that in Part XII the negotiating parties have left only a general framework of provisions which impact upon the conservation of coral reef ecosystems through MPAs. Consequently, with regard to the ways in which international law promotes the use of MPAs for conservation purposes, the LOSC specifically envisages that concerned parties must look outside of its provisions for the formulation and elaboration of international rules, standards and recommended practices etc. The MEAs considered in the following chapters, as well as the regional agreements discussed later in this chapter, are therefore potentially the most significant for this thesis – a fact recognised and encouraged by the terms of the LOSC itself.

Questions will therefore inevitably arise concerning the relationships between the LOSC and pre-existing or subsequent treaties. This is an area which is duly dealt with under the 1969 Vienna Convention on the Law of Treaties,²⁶ although such issues are sometimes better dealt with through dedicated treaty provisions.²⁷ The LOSC adopts the latter approach and addresses the relationship of Part XII to external MEAs through Article 237. This provision says that Part XII leaves in place the obligations

²⁶ 8 *ILM* 679

²⁷ This issue, along with a more detailed analysis of the Vienna Convention as it impacts upon the Convention on Biological Diversity, is discussed in Chapter 7.

of states under previously agreed conventions relating to the protection and preservation of the marine environment, as well as those undertaken subsequently under conventions concluded in furtherance of the general principles of the LOSC. The only proviso is that these obligations should be carried out in a manner consistent with the general principles and objectives of the LOSC.

Perhaps one of the more significant effects of this provision is that it maintains the importance of the maritime zones with respect to powers and duties of coastal and third party states. Thus, a subsequent agreement such as the Convention on Biological Diversity might encourage the designation of MPAs, but only in a manner consistent with the powers of coastal states applicable in the maritime zones in which the MPA will be located – these powers themselves being a careful balance reflecting the interests of coastal states and those states wishing to navigate in maritime waters. Indeed as will be seen, the Convention on Biological Diversity explicitly subordinates itself to the ‘law of the sea’; which phrase it can be assumed includes at least the LOSC.

The framework approach of these provisions from a coral reef and MPA perspective is therefore supported by the provisions on the relationship between the LOSC and other conventions. However, whilst Part XII might be dedicated to the protection and preservation of the marine environment, albeit with a particular focus on pollution, there are other articles within the LOSC which have some bearing upon coral reef ecosystems and the use of MPAs to further their conservation. These articles are of relevance because of the important role coral reefs play as habitat for marine living resources.

The LOSC represented a significant development for fisheries management. The convention made such progress through attributing jurisdiction over resources to

states by reference to the various maritime zones adopted by the convention. For example, within the Territorial Seas, the coastal state exercises territorial sovereignty and therefore enjoys full authority to enact and enforce its own fisheries laws and regulations. Such power is only subject to the right of innocent passage of third party states, obligations under other provisions of the LOSC (such as Article 192) and obligations accepted by the coastal state under other agreements.

Perhaps the main development, however, was the recognition of the EEZ – a zone of up to 200 miles in width measured from the coastal state's baseline.²⁸ Rather than having territorial sovereignty within this area, the coastal state has sovereignty over particular matters or activities, as provided in Article 56. These include the protection and preservation of the marine environment as described above, and the exploitation, exploration, conservation and management of marine living resources. With respect to the latter, whilst the coastal state is to set allowable catch levels within the EEZ,²⁹ they must take proper conservation and management measures to ensure the resources are not over-exploited and populations of harvested species are maintained or returned to a level which supports maximum sustainable yield.³⁰ These measures must also take account of the effects on species which are associated or dependent upon harvested species so that the population levels of these dependent or associated species remain above the level where their capacity to reproduce is not seriously threatened.³¹

²⁸ LOSC Article 57.

²⁹ LOSC Article 61(1).

³⁰ LOSC Articles 61(2) and 61(3).

³¹ LOSC Article 61(4).

These rules on regulating the utilization of marine living resources are commendable for their recognition that catch levels need to be set so as to take account of knock-on effects upon dependent or associated species – an important issue in the context of coral reef ecosystems, as has already been noted. The provisions are also drafted in wide enough terms to include, in theory at least,³² the use of MPAs as part of the conservation and management measures which a coastal state could employ. Nevertheless, the convention fails in these articles to mention MPAs specifically or to promote their use in managing marine natural resources. Furthermore, as has already been mentioned, it is doubtful whether the articles focusing upon the EEZ are of relevance to many of the earth's coral reef ecosystems.

In summary, it is apparent that the LOSC contains few articles of note on the conservation of coral reef ecosystems through MPA strategies. Instead, the majority of the environmental provisions in the convention focus upon pollution control or fishing control in the EEZ. Further, the framework nature of those provisions, which have been drafted in wide enough terms to remain of relevance to coral reef ecosystem conservation through MPA strategies, is such that the LOSC leaves much to other MEAs and regional agreements to meet its general environmental objectives. Where, however, the LOSC does play a potentially crucial role is in its effect upon the capacities of states to actually designate MPAs in the first place. It is this matter to which this study will now turn.

³² See the following discussion on the powers of coastal states to establish MPAs in the various maritime zones.

2.2 DESIGNATING MPAS IN THE MARITIME ZONES

In adopting an MPA strategy, coastal states will be hoping to improve their control over particular activities in order to achieve management goals. A state may therefore be keen, *inter alia*, to control diving around a coral reef, implement measures to regulate the size of fish catches in an area, prohibit particular forms of fishing, manage scientific research and restrict access of boats or ships. Where a state is pursuing enclave strategies on land and within its borders, it exercises full sovereign powers. The state therefore has full discretion to legislate and enforce regulations on all activities within a terrestrial reserve. These circumstances do not apply, on the other hand, in maritime waters since the coastal state does not always exercise full sovereign powers over the sea. In maritime waters, other states may have rights and duties of their own, which in turn affects the degree of power held by the coastal state. This poses a potentially serious threat to the ability of coastal states to create and manage MPAs in accordance with conservation goals. The nature of this system must, therefore, be explored in more detail.

The mechanism for determining the varying degrees of power of interested states is based upon de-limiting the sea into zones in which distinct rules apply as to the authority of states. For the purposes of this study, it should be noted that the division of the sea includes the following relevant zones, as illustrated in Diagram 2:

1. Internal Waters;
2. the Territorial Sea;³³
3. the Exclusive Economic Zone (the EEZ); and

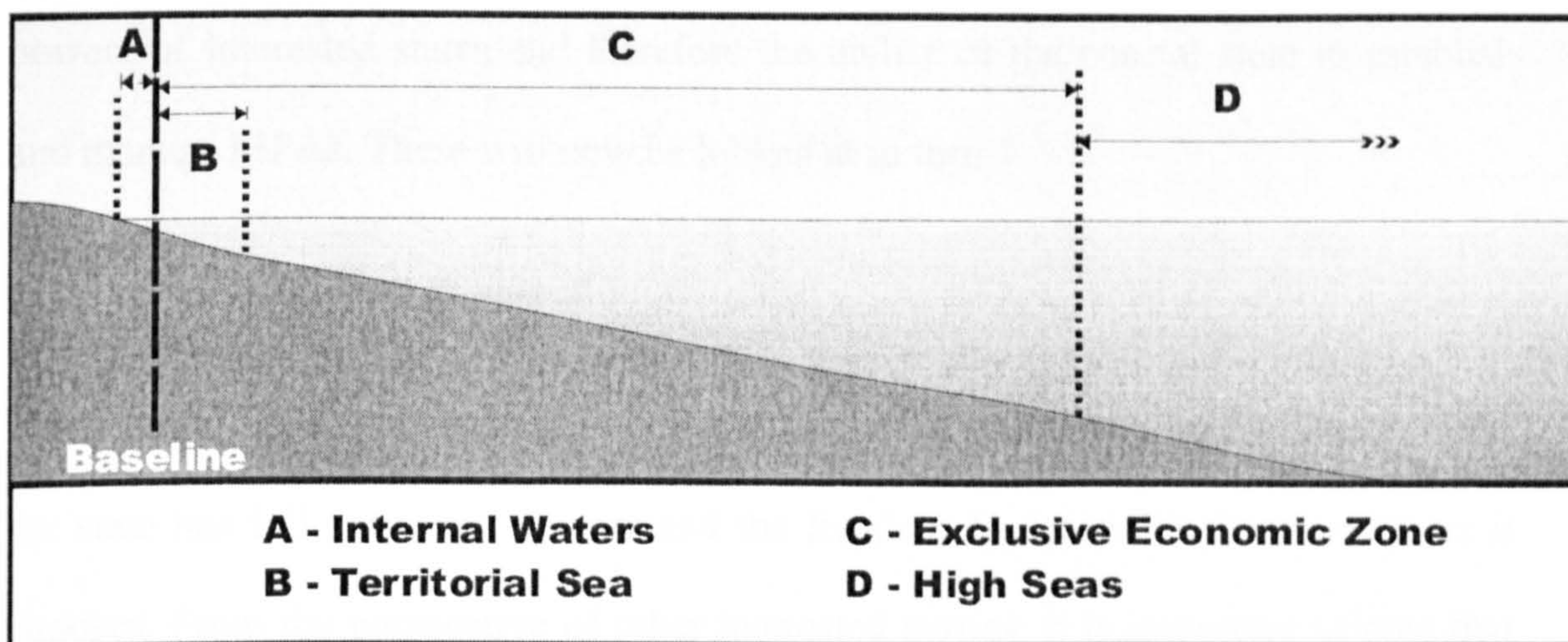
³³ The Contiguous Zone is also of relevance in the context of the prevention or punishment of infringements of certain regulations applicable within the Territorial Sea. The significance of this maritime zone will therefore be discussed in the context of the Territorial Sea.

4. the High Sea.

In addition, special rules apply in straits and for archipelagos.

As Scovazzi rather aptly describes it, this approach to balancing the various interests of states infuses these maritime zones with a distinct legal condition.³⁴ The legal condition of the various areas under the LOSC will therefore now be considered.

Diagram 2 – The Four Relevant Maritime Zones³⁵



The Internal Waters are all those marine waters located on the landward side of the baseline. Due to the ways in which baselines may be drawn, Internal Waters might commonly include bays, estuaries and ports. The Territorial Sea stretches for up to 12 nautical miles from the baseline in a seaward direction.³⁶ The EEZ is an area which a state may elect to claim and which is also measured in a seaward direction from the

³⁴ T. Scovazzi, “Marine Specially Protected Areas Under International Law” in T. Scovazzi (ed.), *Marine Specially Protected Areas* (Kluwer) (1999) 17 at 18:

“The situation is different in the sea, as the content of coastal State’s rights with respect to those of third States varies in relation to the legal condition of the waters...”

³⁵ This illustration is a simplified version of the diagram found in Churchill and Lowe, *supra* n.2 at 30.

³⁶ LOSC Article 3. The Contiguous Zone stretches for up to 24 nautical miles from the baseline under Article 33

baseline for up to 200 nautical miles.³⁷ A state may choose to claim an area less than 200 nautical miles, or may be obliged to do so on account of the competing claim made by a neighbouring state. In the majority of cases, the High Seas then lie beyond the limits of the EEZ. The High Seas is an area over which no state exercises sovereignty. It is therefore an area where MPAs cannot be created through the unilateral decision of a state. This is not the case in internal and territorial waters, nor in the EEZ, where the various legal conditions of these zones govern the respective powers of interested states and therefore the ability of the coastal state to establish and manage MPAs. These will now be looked at in turn.

2.2.1 MPAs in Internal Waters

The Internal Waters are treated as being akin to a coastal state's land territory. Here, the state has full sovereign powers and the freedom to deal with these waters as it chooses. From the perspective of other interested parties, it is important to note that these powers of the coastal state are rarely tempered by the powers of others. Unless permitted by prior agreement (usually bilateral), as a general rule vessels from other states may not enter Internal Waters, nor demand access to a coastal state's ports. Indeed such vessels may only enter a port when the vessel is in distress and there is a danger to human life in accordance with customary law.³⁸ One further limited exception is provided in the LOSC, according to which vessels may pass through Internal Waters where a baseline drawn to reflect a coastline characterised by heavy

³⁷ LOSC Article 57.

³⁸ See for further discussion, D. P. O'Connell, *The International Law of the Sea Vol. II* (OUP) (1984) at 853-858; Churchill and Lowe, *supra* n. 2 at 63.

indentation or fringing islands encloses waters which were not previously regarded as internal.³⁹

Thus the legal condition of the Internal Waters of a coastal state poses no real practical or legal constraints upon the authority and ability of a coastal state to designate and manage an MPA. This is not the case, however, as coastal states move in a seaward direction from their baselines into the remaining maritime zones.

2.2.2 MPAs in the Territorial Sea

Historically, the belt of water running adjacent to the baseline on the seaward side has been regarded as having its own special legal character, although the details of this zone have provoked controversy. As regards the width of the belt of water, the LOSC resolved differing approaches by finally settling upon a figure of up to 12 nautical miles.⁴⁰ States had also been divided as to whether the coastal state exercised full sovereign powers within this area, or whether they simply had jurisdiction over particular activities such as fishing or security. Over time, support grew in favour of the proponents of sovereignty.⁴¹ Today, Article 2 of the LOSC expresses this position as follows:

1. The sovereignty of a coastal state extends, beyond its land territory and Internal Waters and, in the case of an archipelagic state, its archipelagic waters, to an adjacent belt of sea, described as the Territorial Sea.

³⁹ LOSC Art. 8(2) and The 1958 Convention on the Territorial Sea and the Contiguous Zone, Art 5(2), 516 UNTS 205.

⁴⁰ LOSC Art. (3).

⁴¹ For an account of the development of the Territorial Sea, refer to Churchill and Lowe, *supra* n. 2 at 71-75.

2. This sovereignty extends to the air space over the Territorial Sea as well as to its bed and subsoil.

3. The sovereignty over the Territorial Sea is exercised subject to this Convention and to other rules of international law.

Since it is sovereign territory, the powers of the coastal state to legislate and enforce regulations in this belt are only limited to the extent expressed in sub-paragraph (3). Obligations accepted by the coastal state under treaties may therefore be applicable to the Territorial Sea in addition to those already discussed in this chapter relating to the protection and preservation of the marine environment. Further, one particular right of third party states continues to be acknowledged as critical in this zone. This is the right of innocent passage.

States seeking to exercise the right of innocent passage must ensure that they satisfy the criteria governing the exercise of this right under the LOSC. Passage according to Article 18, is restricted to navigation through the Territorial Sea in order to traverse it, or to travel to and from the Internal Waters. Such navigation must be continuous and expeditious. Hovering is not permitted, although stopping to way anchor is permitted but only where it is incidental to passage or needed for safety reasons – perhaps as part of assisting another vessel in distress.

The definition of innocent has, however, traditionally been a far more contentious issue. Historically, this issue has generated divergent views as to whether a vessel must engage in a proscribed act and/or be in breach of a coastal state's laws to lose its innocence, or whether the manner of the passage may more generally be regarded as being of a non-innocent nature. In 1958, the Territorial Sea Convention favoured the latter and provided that passage would be innocent as long as it was not prejudicial to

the peace, good order or security of the coastal state. In general, therefore, no particular act needed to be undertaken nor law breached to immediately deprive passage of innocence. However, this definition was amended in the text of Article 19 to the LOSC – an article which Churchill and Lowe claim is rapidly being transformed into customary international law.⁴²

Article 19(1) repeats the earlier provision of the Territorial Sea Convention but goes on in sub-section 2 to list a number of activities which if engaged in by a vessel shall automatically be regarded as prejudicial to the peace, good order or security of the coastal state. Some of these activities are of relevance to the current discussion, namely:

Article 19(2)...

(g) the loading or unloading of any commodity, currency or person contrary to the customs, fiscal, immigration or sanitary laws and regulations of the coastal State;

(h) any act of wilful and serious pollution contrary to this Convention;

(i) any fishing activities;

(j) the carrying out of research or survey activities; ...

(l) any other activity not having a direct bearing on passage.

Passage which is not innocent, or indeed navigation which does not amount to passage, renders the vessel subject to the coastal state's laws⁴³ and exposes it to the coastal state's full powers of enforcement under the LOSC.

⁴² Churchill and Lowe, *supra* n. 2 at 87.

⁴³ *Ibid* at 95.

This study will therefore now turn to the implications of these articles upon the ability of a coastal state to establish and manage an MPA in order to conserve coral reefs. First, the act of designating the area is arguably permitted pursuant to the coastal state's sovereign powers over the Territorial Sea. However, practical and legal difficulties are likely to be encountered when the coastal state attempts to regulate the activities within that area of vessels operating under the flag of other states.⁴⁴ What are the merits of establishing an MPA prohibiting or regulating, for example, fishing, tourist access, scientific research or navigation, if a vessel flying the flag of another state may rely on its own rights in the maritime zone to act in a manner which undermines that regime? This is the dilemma faced in the Territorial Sea (and the EEZ).⁴⁵

Within the Territorial Sea, the problems faced by coastal states are likely to be limited. Foreign vessels are only entitled to traverse the Territorial Sea in accordance with the right of innocent passage, and will therefore need to comply with coastal state legislation, or become subject to enforcement measures.⁴⁶ Furthermore, many of

⁴⁴ The coastal state can impose and enforce its own laws prohibiting particular activities against vessels operating under its own flag

⁴⁵ The EEZ is discussed later in this chapter.

⁴⁶ This is arguably reinforced where the coastal state has claimed a Contiguous Zone since it enjoys enforcement jurisdiction within this area with respect to infringements of its customs, fiscal, immigration or sanitary laws and regulations applicable within its Territorial Sea, pursuant to Article 33. The importance of this zone seemingly turns upon interpreting "sanitary" in a manner to include the types of environmental laws and regulations operating within MPAs. This may not be so easy. There is some support to the effect that such laws and regulations include vessel source pollution control (see T. A. Clingan, *The Law of the Sea: Ocean Law and Policy* (Austin & Winfield) (1994) at 139-143) but as has been said, this is not a great threat to coral reef ecosystems. More generally it has been said that such rules and regulations relate to matters of health (S. Oda, "The concept of the contiguous zone" (1962) 11 *ICLQ* 131 at 146). This might be more supportive of an interpretation to include the laws and regulations operable within an MPA since such laws and regulations may seek to

the activities which a coastal state will wish to regulate within an MPA are, or could easily be, of a kind that could deprive passage of its 'innocence' in accordance with Article 19(2). Plainly, however, this cannot be true of navigation since this is the very act which the right of innocent passage seeks to protect. This could potentially leave the coastal state in a dilemma, since it may establish an MPA to conserve coral reef ecosystems only for these habitats to be disturbed or placed at risk by vessels passing through the enclave pursuant to the right of innocent passage. How real is this dilemma?

From the outset, it is worth noting that the danger to vessels themselves of navigating in close proximity to coral reefs may deter captains of some vessels from exercising their right of innocent passage in such areas, particularly if an MPA helps them to identify such dangerous waters. However, it may also be possible for the coastal state to force all vessels away from MPAs within the Territorial Sea as a matter of law.

LOSC Article 21 outlines the range of laws and regulations which coastal states may enact with respect to the innocent passage of vessels. In particular, such laws and regulations may relate to the conservation of the living resources of the sea,⁴⁷ prevention of the infringement of the fisheries laws and regulations,⁴⁸ and the preservation of the marine environment of the coastal state.⁴⁹ Spadi suggests that

secure food resources to sustain healthy local populations. However, given the availability of 200 mile EEZs which give legislative jurisdiction to coastal states over the management of marine resources, efforts to prove or disprove contentions that sanitary laws and regulations can thus be extended seem unnecessary.

⁴⁷ LOSC Art. 21 (1)(d).

⁴⁸ LOSC Art. 21 (1)(e).

⁴⁹ LOSC Art. 21 (1)(f).

these provisions are enough to entitle the coastal state to exclude or limit navigation in particular areas of the Territorial Sea.⁵⁰

A firmer basis for effectively excluding vessels may, nevertheless, exist under Article 22 of the LOSC, which allows coastal states to require vessels to engage in innocent passage through defined sea lanes in order to ensure the safety of navigation. In designating these sea lanes, the coastal state is not entitled to ultimately hamper the innocent passage of vessels⁵¹ and must take account of the factors listed in Article 22(3) e.g. any recommendations with a bearing upon sea lanes from the International Maritime Organisation (the “IMO”), and the density of traffic which will use the route.⁵² The coastal state may not, therefore, designate sea lanes so as to exclude passage throughout the breadth of the Territorial Sea.

Strictly speaking, however, the aim of deploying Article 22 should be to protect vessels from the danger of reefs, rather than vice versa. Consequently, forcing vessels with shallower drafts, which could safely navigate over reefs into sea lanes, might be regarded as an unwarranted hampering of the right to innocent passage. Nevertheless, coastal states may be emboldened to use sea lanes for environmental reasons since, as Spadi notes, the power of the IMO to adopt routing measures beyond the territorial waters is increasingly being applied for environmental purposes. This could encourage coastal states to adopt a similar approach in the Territorial Sea where the rights of foreign states are comparatively weaker.⁵³

⁵⁰ F. Spadi, “Navigation in Marine Protected Areas: National and International Law” (2000) 31 *Ocean Development & International Law* 285 at 289.

⁵¹ LOSC Art. 24.

⁵² LOSC Art. 22 (3).

⁵³ Spadi, *supra* n. 50 at 290.

In summary, the sovereign powers of the coastal state within the Territorial Sea are strong enough to allow the promotion of MPA strategies for the conservation of coral reef ecosystems. Further, it can be argued that the right of other states to engage in innocent passage is not a significant bar to the designation and effective management of MPAs by coastal states. The fact that many activities which a state may wish to regulate are not permitted as part of engaging in innocent passage goes a long way towards avoiding any conflicts. Finally, the power of the coastal state to require ships to navigate in sea lanes might be used as a means to regulate and even prohibit navigation in MPAs, particularly with respect to larger vessels. Unfortunately, it is doubted whether the same enabling conditions exist within the EEZ, in respect of which the problems raised by the designation of MPAs have been the topic of much research in recent years.

2.2.3 MPAs in the Exclusive Economic Zone

The EEZ, whilst introduced through the LOSC, was intended as a compromise to the historical disagreements which existed over attempts by some countries to claim extended Territorial Seas. In particular, the EEZ was a means to satisfy the growing desires of developing countries to exercise greater control over natural resources found close to their coastlines but not within territorial waters. Since such resources previously fell within the global commons of the High Seas, they were freely available to developed countries with the resources to support long-distance fishing fleets. The EEZ was therefore created under Part V of the LOSC with its own legal condition, distinct from those of the High Seas and the Territorial Sea.⁵⁴

⁵⁴ Indeed, these latter zones have no residual bearing upon the legal regime of the EEZ – Churchill and Lowe, *supra* n. 2 at 165.

Coastal states can choose to claim an EEZ of up to 200 nautical miles measured from their baseline. Within this zone, the LOSC allocates specific powers, rights and duties to coastal and other states with respect to most activities which are pursued in this area. Further, in the absence of any specific provision governing an activity which relates to the EEZ, the LOSC provides guidance for determining the rights and duties of states. These rights and duties shall now be looked at in more detail, starting with those of the coastal state.

First, the EEZ differs significantly from the internal and territorial waters in that the coastal state does not enjoy territorial sovereignty in this zone. Instead, the coastal state exercises sovereignty and jurisdictional competence over particular issues or activities. Thus the LOSC initially provides that the coastal state exercises full sovereign rights over:

exploring and exploiting, conserving and managing the natural resources, whether living or non-living, of the waters superjacent to the seabed and of the seabed and its subsoil, and with regard to other activities for the economic exploitation and exploration of the zone, such as the production of energy from the water, currents and winds;⁵⁵

This seems to cover a number of activities beyond the obvious exercise of sovereign rights over the fisheries of the EEZ. For example, tourist activities focused upon interest in marine ecosystems such as coral reefs represent a form of exploitation of both the living and non-living natural resources. The LOSC therefore seems to afford the coastal state full sovereign rights over a number of activities which MPAs might seek to manage or control.

⁵⁵ LOSC Art. 56 (1)(a).

Part V of the LOSC goes on to allocate jurisdiction to the coastal state within the EEZ over particular issues which are dealt with under other parts of the convention. Specifically and under Article 56 (1)(b), the coastal state exercises jurisdiction over scientific research, as well as over the protection and preservation of the marine environment.

The EEZ is, of course, also an area of the sea in which foreign states also enjoy rights of their own which are more extensive than those afforded to them in the Territorial Sea. Thus, Article 58 recognises that all states enjoy the freedom to navigate, to over fly and to lay submarine cables in the EEZ. Of particular note, of course, is that the first freedom, that of navigation, is not subject to the same restrictions as that of innocent passage, and therefore is potentially of more threat to the management of MPAs. This concern, however, pre-supposes that the power actually exists for parts of the EEZ to be designated as an MPA by a coastal state. This study will look at that issue first.

The LOSC only specifically refers to the creation of MPAs in the EEZ in Article 211(6) of Part XII on the Protection and Preservation of the Marine Environment. This article allows for the creation of MPAs with the approval of the IMO in special circumstances where general rules and standards for reducing, controlling and preventing pollution from vessels are deemed inadequate for a given area of the EEZ. This provision is, of course, restricted to the particular issue of vessel-source pollution, which is arguably of limited significance for the conservation of coral reefs.⁵⁶ As noted earlier, MPAs are intended to manage a far more diverse range of

⁵⁶ See further *supra* n. 16 where a more flexible interpretation of vessel-source pollution might enable the coastal state to push for IMO approval of a protected area in order to avoid grounding of vessels and the dropping of anchors, and to restrict boat-based diving operations.

activities and to meet other aims beyond simply pollution control, prevention and reduction. The question therefore becomes whether or not the LOSC gives coastal states the authority to designate MPAs in order to control resource exploitation, tourist activity, scientific research or to protect coral reefs as particularly sensitive ecosystems and habitats for threatened species.

The provisions of the LOSC do seem to favour a positive response. To begin with, Article 56 (as quoted earlier) appears to allocate sovereignty to the coastal state for designing and implementing management structures for non-living and living natural resources. This right might be grounds enough for justifying coastal states opting to pursue MPA strategies in order to manage coral reefs in a manner which supports utilization of the resources of these ecosystems. Such utilization can, of course, cover fishing and other extractive activities, as well as tourist operations. Indeed, in relation to the former, the authority of the coastal state to create MPAs in order to regulate fishing seems to be specifically envisaged in Article 62 which requires all other states to respect a coastal state's laws and regulations which regulate specific areas in which fishing is permitted or prohibited.⁵⁷

Creating MPAs as part of resource management therefore seems to fall within the sovereign powers of the coastal state. However, does the coastal state possess similar powers to create MPAs in order to control scientific activity, or, simply, to protect sensitive ecosystems and habitats, as Lagoni suggests some states are trying to do?⁵⁸

This study will initially consider the latter.

⁵⁷ LOSC Art. 62 (4)(c).

⁵⁸ Lagoni, *supra* n. 17 at 157.

It is evident that duly conserving ecosystems and habitats will often turn upon controlling human demands and activities – in the main resource exploitation. If the goal of ecosystem and habitat protection turns upon managing resource exploitation, as suggested above, then the power of the coastal state to designate MPAs seems implicit in the terms of the LOSC. However a more general authority of the coastal state to designate MPAs in the EEZ for conservation purposes seems to exist elsewhere.

As has already been noted, Part V of the LOSC deals with the EEZ as a geographic area of the ocean realm. In this Part, Article 56 (1)(b)(iii) provides that in this area, jurisdiction over the protection and preservation of the environment lies with the coastal state. This means that the coastal state has the authority and responsibility to enact and enforce legislation for protecting and preserving the environment of the EEZ. By the same token, jurisdiction over scientific research within the EEZ has been allocated to the coastal state. It therefore seems to the author that the LOSC gives the coastal state jurisdiction over environmental protection and preservation as well as scientific research, in such a manner that the coastal state could choose to enact legislation which creates MPAs in the EEZ. There is, however, one major restraint upon this authority, which is that its exercise must not affect the freedoms of other states to engage in navigation, over flight and the laying of submarine cables. This does not outlaw the establishment of MPAs, but may have serious repercussions for their management. The impact of such rights upon the effectiveness of MPAs in the EEZ must therefore be considered.

In short, this is the same problem as was encountered with respect to MPAs in the Territorial Sea. Whilst some of the activities which an MPA will seek to control, such as fishing and tourism, can legally and practically be managed by the coastal state in

MPAs, the freedoms of other states within the EEZ threaten to undermine the management of these enclaves. As Spadi says:

It could thus be asked whether there is any use in establishing a protective regime for an area where a particularly fragile marine ecosystem is located, if foreign super tankers or ships carrying hazardous wastes are expected to move around the area.⁵⁹

Given that rights of navigation constitute the major threat to the effective management of MPAs within the EEZ, it is important to consider whether these rights can be restricted or excluded within such areas.

The generally accepted position is that coastal states may not unilaterally prohibit navigation within particular areas of the EEZ. This is reflected in state practice, where legislation has generally respected the freedom of navigation.⁶⁰ De Klemm has noted that:

There are often strong objections to the placing of prohibitions or restrictions on navigation and mooring, on the grounds that these run counter to the freedom of navigation enshrined in the new Convention on the Law of the Sea.⁶¹

Most commentators, however, recognise that the freedom of navigation may be restricted, though only with the consent of the IMO. This view is based on two arguments, the first of which has already been noted. Coastal states have the power to establish MPAs in the EEZ pursuant to Article 211(6), i.e. where IMO agrees that the

⁵⁹ Spadi, *supra* n. 50 at 18.

⁶⁰ For a good account of national legislation reflecting the attitudes of states towards legislating in a manner which restricts or prevents navigation, see Spadi, *supra* n. 50 at 286-289.

⁶¹ Quoted in Spadi, *supra* n. 50 at 287.

pre-conditions relating to vessel source pollution prevention, control and reduction have been met. The state may then adopt rules and regulations for the area including those regulating navigational practices. As has been said, however, vessel source pollution may not be such a key issue for the conservation of coral reefs.

The second mechanism for regulating navigation in an MPA is through having the enclave recognised by IMO as a Particularly Sensitive Sea Area (“PSSA”). An MPA will only secure such recognition if it needs special protection because of its significance for ecological, socio-ecological or scientific reasons, and if it is vulnerable to environmental damage by marine activities. Once the area has been recognised as a PSSA, the authority of IMO to regulate shipping, including routing measures, is confirmed.⁶² A number of significant coral reefs are actually recognised by IMO as PSSAs. For example, the Great Barrier Reef is a PSSA in relation to which a number of recommendations for navigation have been made, including the establishment of shipping routes and pilotage requirements.⁶³

It is therefore widely recognised that the freedom of navigation enjoyed by states, and as supported by the LOSC, can be restricted or even prohibited in MPAs located within the EEZ in the limited circumstances offered by mechanisms founded upon the approval of the IMO. However, Scovazzi has proposed that the freedoms of the sea

⁶² Article 1(a) to the 1948 Convention on the International Maritime Organisation brought the IMO into being in order to regulate maritime matters to the extent that such matters relate to shipping. IMO therefore regulates issues of safety, efficiency of navigation and the control of marine pollution from ships – A. Blanco-Bazán, “The Environmental UNCLOS and the Work of IMO in the Field of Prevention of Pollution from Vessels” in A. Kirchner (ed), *International Marine Environmental Law – Institutions, Implementation, and Innovations* (Kluwer) (2003) 31 at 31-32.

⁶³ See generally P. Ottesen *et al*, “Shipping Threats and Protection of the Great Barrier Reef Marine Park – The Role of the Particularly Sensitive Sea Area Concept” (1994) 9(4) *IJMCL* 507.

may be more widely open to restriction under modern international law.⁶⁴ His argument notes the fact that the freedom of the sea principle is a concept developed in the early 17th century. He claims:

To rely in an absolute way on the principle of freedom of the sea was justified in the circumstances existing in the past. But this is no longer true. Today it cannot be sustained that a State has a right to engage in a specific marine activity simply because it enjoys freedom of the sea, without giving any further explanations and without being ready to consider the opposite positions, if any, of the other interested states.⁶⁵

In particular, Scovazzi says that the principle of freedom of the sea, which includes the freedom of navigation, must be balanced with interests which have a collective character since they belong to the international community. The protection of the environment and sustainable development are such interests, which themselves are moving towards being principles of customary law. He therefore concludes that there can be no predetermined solution to the conflict between the interests of states exercising their freedoms, and a coastal state's wish to create and manage an MPA. Factors such as the fragility of the ecosystem in question as well as the practical disruption that would be caused to navigation, he suggests, would lie at the heart of determining the appropriate balance between these competing interests.

Despite these arguments, the reality is that IMO approval remains the commonly accepted route to controlling navigation through MPAs. Of course, it should also be recognised that, in practical terms, few captains of vessels will want to navigate in the

⁶⁴ T. Scovazzi, *supra* n. 34 at 19-20.

⁶⁵ *Ibid* at 19.

vicinity of coral reefs if they pose a danger to safety. They may, consequently, welcome the identification of such areas through MPAs. Therefore, it appears that, through a mixture of legal authority and practical reality, MPAs created in accordance with the powers of the coastal state in the EEZ could be successfully managed in order to control many of the activities which threaten these ecosystems.

2.2.4 Designating MPAs in the Various Maritime Zones – A Summary

What has become increasingly apparent from the above, is that the coastal state's ability to establish and manage MPAs for coral reef ecosystems is relatively unfettered by the law of the sea regime. Nevertheless, obstacles posed by the freedoms of other states in marine waters do become more testing for coastal states as they move away from their baselines. As such, the hardest activity to control by means of regulation is navigation and this is particularly so in the EEZ. Ultimately, however, such limitations are not insurmountable, and may themselves be reduced by the realities of navigation in areas of coral reefs.

2.3 THE SIGNIFICANCE OF THE DISTRIBUTION OF CORAL REEFS BETWEEN THE MARITIME ZONES

It seems from the preceding analysis that the ease with which a coastal state can manage an MPA covering areas of coral reef will vary to a degree depending upon the maritime zone in which the reef is located. The problem this study faces, however, is an inability to comprehend the significance of this in terms of actual reef distribution between these areas. For instance, are the comparatively weaker powers of the coastal state in the EEZ actually a significant issue if the vast majority of the world's coral reefs lie within internal and territorial waters?

As suggested, this question cannot currently be answered. Whilst the coral reefs of the world have been charted by Spalding,⁶⁶ no data exist for the distribution of these reefs by reference to the maritime zones.⁶⁷ That said, examples of coral reef formation in Internal Waters, the Territorial Sea and the EEZ⁶⁸ can be pointed to as support for the relevance of the preceding discussions. Nevertheless, without the necessary data, gauging the significance of the legal regimes for each area is extremely difficult. This study must therefore content itself at this stage with more general observations about the likely distribution of coral reefs.

2.3.1 *Islands Nations*

The only specific provisions on coral reefs and maritime zones are found in Article 6 of the LOSC. This part of the convention was intended to assist island nations lying within, or in close proximity to, lagoons formed by coral reefs.⁶⁹ Such a situation arises in relation to Atoll and Barrier Reefs. Diagram 3 illustrates this, with the island nation in question being represented by either the central land mass in illustration 3B

⁶⁶ M.D. Spalding *et. al.*, *World Atlas of Coral Reefs* (University of California) (2001).

⁶⁷ A fact confirmed in e-mail correspondence by Ms M. Cordiner on behalf of UNEP/WCMC, 21st March 2005. The 'Sea Around Us' project, run by the Fisheries Centre at the University of British Columbia, lists coral reef incidence in EEZ's for individual countries. However, Mr R. Watson of the University of British Columbia has confirmed to the author in e-mail correspondence that the listed percentages are for coral reefs found from the coastline out to 200 nautical miles. The figures therefore include reefs found in Territorial Seas as well as the EEZ. The 'Sea Around Us' analysis also suggests that there are no coral reefs found in the high seas. See www.seaaroundus.org.

⁶⁸ For example, the map of *Australia's Maritime Zones in the Torres Strait*, (2002) produced by the Australian Hydrographic Office and Geoscience Australia (and available at www.gs.gov.au), shows numerous reefs in all three zones.

⁶⁹ I. Kawaley, "Delimitation of Islands Fringed with Reefs: Article 6 of the 1982 Law of the Sea Convention" (1992) 41 *ICLQ* 152 at 153.

(Barrier Reef), or the 'Dry Land' in illustration 3C (Atoll Reef).⁷⁰ Without a special intervention, these states would have needed to draw baselines in accordance with Article 5 along the low water mark of their coastline. Where the off-shore lagoon was wide and extensive, this could leave the state with little control over that lagoon and its resources. Such a lack of control is significant since these resources are often important to the well-being of the local population.

The LOSC therefore provided special rules which were intended to ensure that the lagoon could be regarded as the Internal Waters of the island state, with all the control that would entail. Article 6 provides

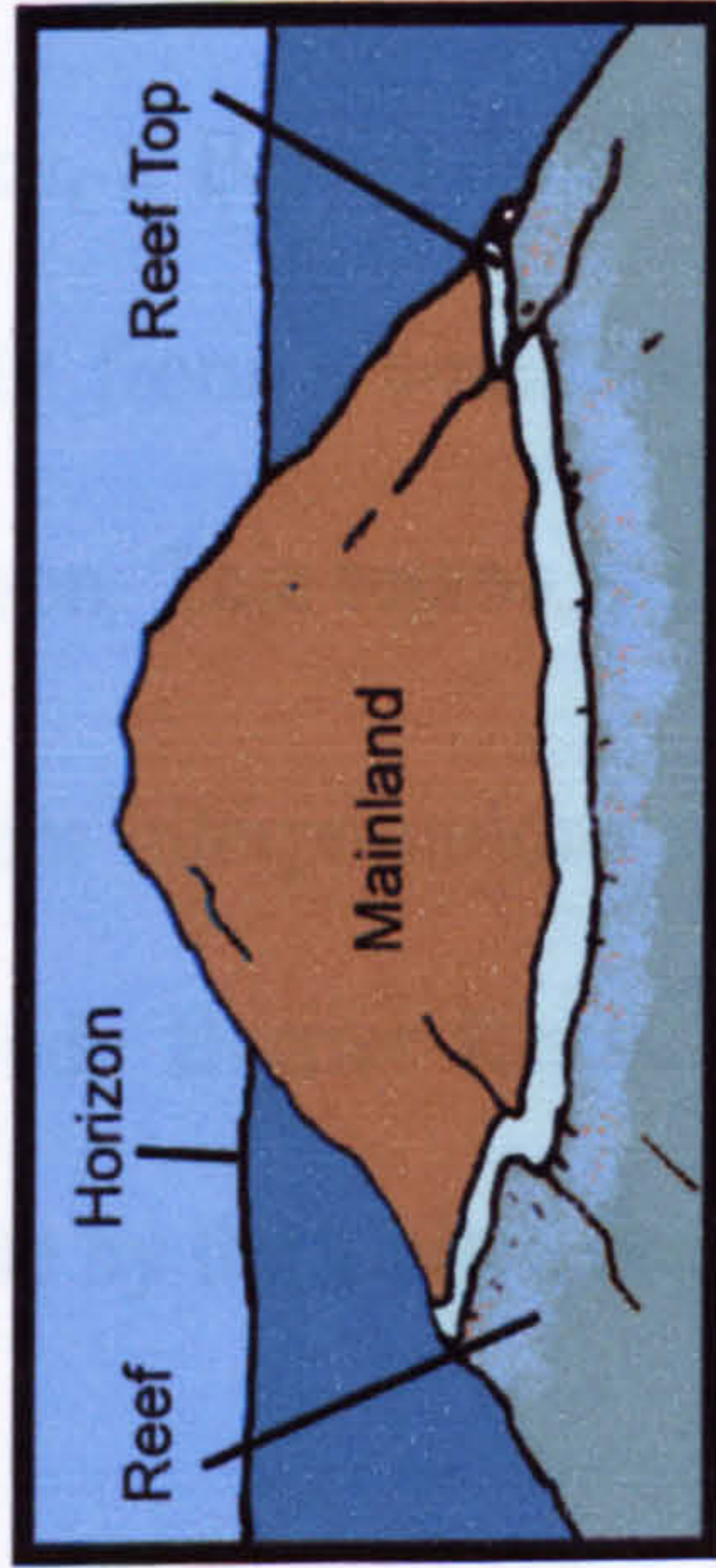
In the case of islands situated on atolls or of islands having fringing reefs, the baseline for measuring the breadth of the territorial sea is the seaward low-water line of the reef...⁷¹

The out-lying reefs therefore determine the baseline for these island nations, leaving any lagoon as Internal Waters and under the full control of the coastal state. Further, and returning to the theme of this section, given that the points on the reef-top which become exposed at low tide will dictate the course of the baseline, these out-lying reef formations will be located either side of that baseline in either Internal Waters or in the Territorial Sea. Any other reefs within the lagoon, such as Patch Reefs (see footnote in Diagram 3), will also fall under the legal regime for Internal Waters.

⁷⁰ Diagram 3 has been adapted from a similar illustration in Spalding, *supra* n. 66.

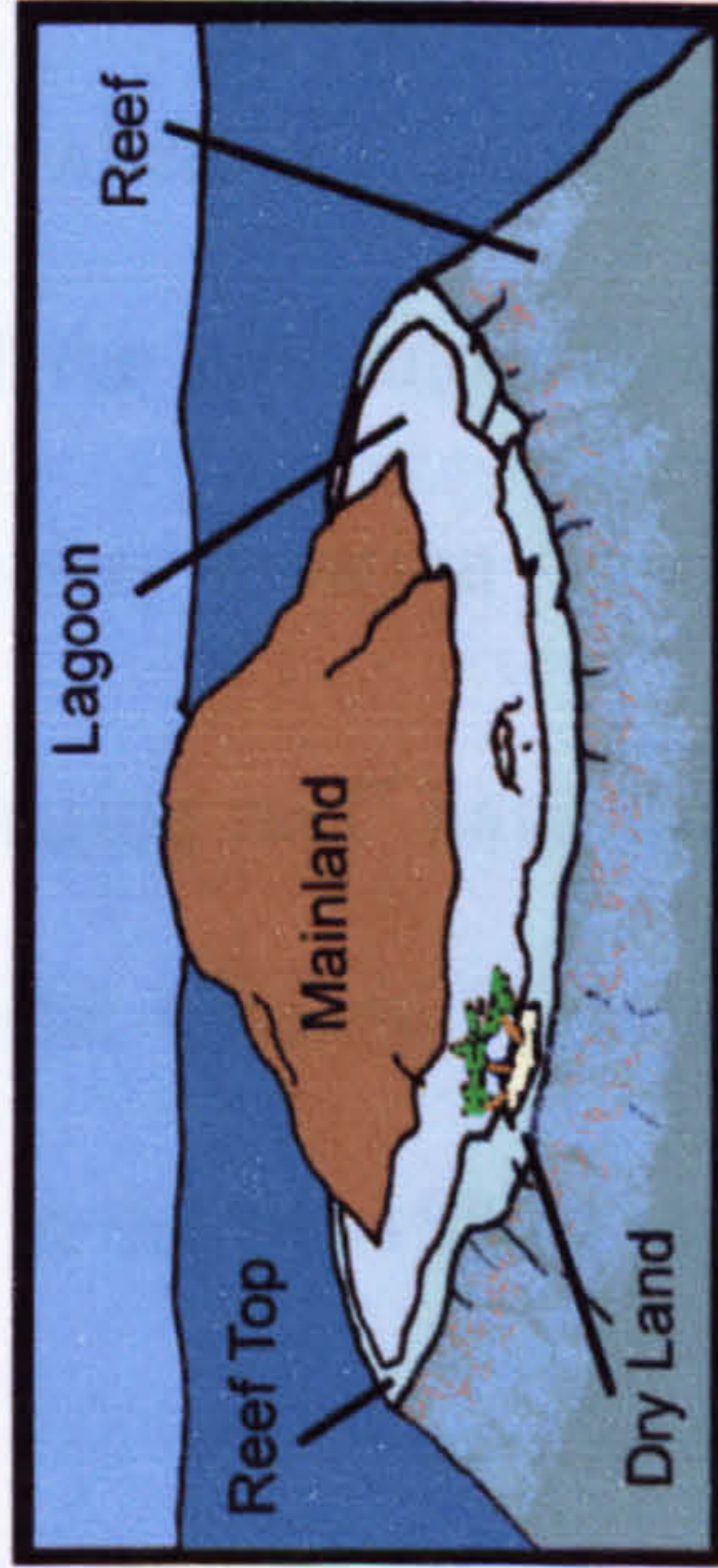
⁷¹ For a general critique of these provisions, including the apparent lack of provision for drawing closing lines across inlets to atoll lagoons, see P. B. Beazley, "Reefs and the 1982 Convention on the Law of the Sea" (1991) 6(4) *International Journal of Estuarine and Coastal Law* 281 and Kawaley, *supra* n. 69.

Diagram 3 : 3-D Representation of the
Principal Types of Coral Reef and the Formation of Atolls



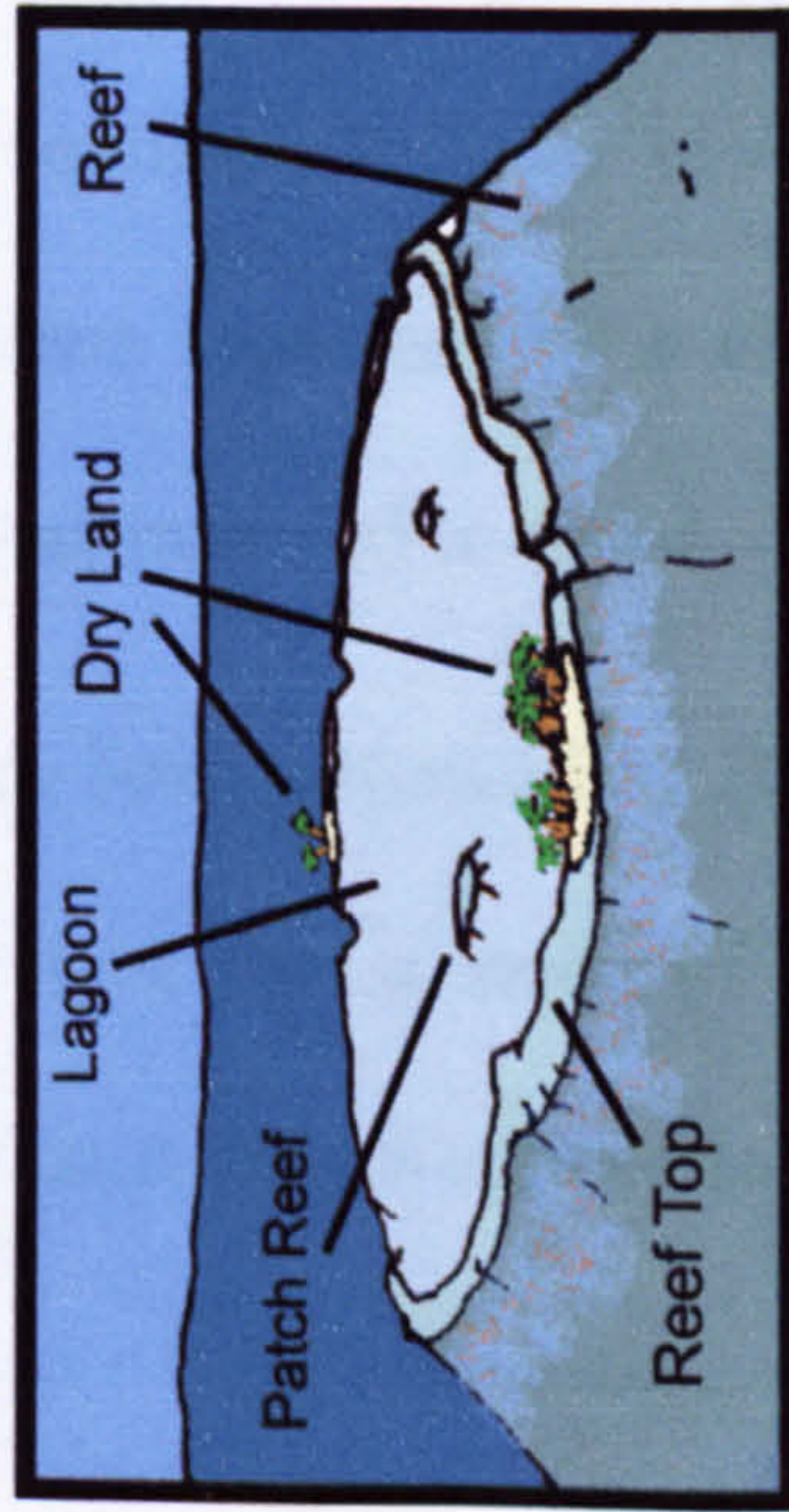
3A

3A. Fringing Reef : Reefs form in the shallow waters around the island on the shelving coastline. Note there is no channel or body of water between the reef structure and the coast. Further, upward growth may result in parts of the reef top being exposed at low tide. (The same processes can occur in relation to continental land masses)



3B

3B. Barrier Reef : If the island subsides or becomes flooded by rising sea levels, upward growth of reef leads to the formation of a lagoon between the new coastline, and the reef structure. * Barrier reef structures may develop such that parts of the reef top become exposed at low tide. Further, through erosion, debris and sand may accumulate on parts of the reef top leading to permanently exposed areas of dry land. (The same processes can occur in relation to continental land masses)



3C

3C. Atoll Reef : These reefs are formed in relation to volcanic islands which have over time subsided and disappeared beneath the surface of the sea. The associated reef structure will have initially developed as a Fringing Reef, before becoming a Barrier Reef and finally a ring-shaped Atoll Reef when the volcanic island is lost (i.e. 3A followed by 3B then 3C). The Atoll Reef will protect a circular lagoon,* and again may give rise along the reef top to islands of permanently dry land, and patches of reef exposed at low tide.

* Another common type of reef (Patch Reefs) may develop within the calm waters of lagoons.

One problem arising from the article, and with implications for this section, relates to interpreting the meaning of ‘fringing reefs’. As Churchill and Lowe note, the geomorphological sense of the term refers to a reef extending from a shore but which is not separated from that shore by a channel of water – as illustrate in 3A (Fringing Reef) in Diagram 3.⁷² If Article 6 is adopting such a specific interpretation, there would be two consequences. First, the article would be departing from the underlying reasons for its inclusion in the LOSC, namely providing the island state with control over resources found in a body of water lying between the coastline and the reef. Second, Fringing Reefs (and indeed Atolls) are not the only forms of coral reef. For example, marine biologists recognise Barrier Reefs as another formation (as shown in Diagram 3). Logically, if Article 6 is adopting a strict interpretation of ‘fringing’ and ‘atoll’ reefs, then the particular use of these terms implies that other reef formations are excluded from the application of the article.

Whilst the first consequence does not necessarily undermine the objectives lying behind the inclusion of Article 6, the same can not be said for the exclusion of Barrier Reef formations. As explained and illustrated in Diagram 3, in geomorphological terms, a Barrier Reef arises where a Fringing Reef continues to grow upwards and away from a coastline, and the reef and shore become separated by a channel or lagoon. This seems to be the very situation Article 6 was intended to cover.

Wider interpretations of ‘fringing reef’ have therefore been advanced by Beazley to include Barrier Reefs,⁷³ whilst Churchill and Lowe note that a study of baselines made by the United Nations in the late 1980’s stated that Article 6 applied to any reef,

⁷² Churchill and Lowe, *supra* n. 2 at 52.

⁷³ Beazley, *supra* n. 71 at 283.

including Barrier Reefs, separated from the low water line of an island's coast.⁷⁴ Nevertheless, uncertainty persists as to whether there is a limit to the distance Barrier Reef formations may lie off the coast of the island state.⁷⁵ Subject to this, Article 6 should ensure that many reef formations, relating to island nations, lie in close proximity to that state's baseline, with a knock-on effect upon them falling within Internal Waters or the Territorial Sea.

2.3.2 *Continental States*

But what of those cases where the coastal state is not an island? Does such a trend towards coral reefs being located in close proximity to baselines persist in these situations? At this point a number of observations can be made. First, with the driving force of reef formation being photosynthesis, coral reefs are generally shallow marine habitats where light penetration through water is greatest. Many coral reefs are therefore found fringing the coastlines of states (as per illustration 3A in Diagram 3), since at these points the continental shelf will usually lie under a depth of water which is still shallow enough to support reef formation. Such a trend towards inshore distribution will result in many coral reefs lying close to the coastal state's maritime baselines,⁷⁶ leading to a tentative assertion that there is a greater statistical possibility that they will be located in Internal Waters and/or the Territorial Sea.⁷⁷

⁷⁴ Churchill and Lowe, *supra* n. 2 at 52. It should be remembered that whilst this could suggest Fringing Reefs are not included, these reef formations follow the coastline of the island state and will be located in close proximity to that nation's baseline under the normal rule in Article 5 in any event.

⁷⁵ *Ibid.*

⁷⁶ Again, under Article 5 of the LOSC the normal baseline is the low water mark along the coast as marked on large scale charts recognised by the coastal state.

⁷⁷ Of course, the exceptions to this generalisation are Barrier Reefs found offshore of coastal states. These may not conform to this trend if they have formed far from the shoreline, perhaps because the

Second, the nature of reef formation and particular provisions of the LOSC suggest a greater probability of coral reefs lying along the course of baselines. Under Article 5, the normal baseline is the low water mark along the coast as marked on large scale charts recognised by the coastal state. In relation to this article, two points can be made. To begin, where coral reefs have precipitated the accumulation of debris onto the reef top to form permanently exposed dry land (see for example, illustration 3B in Diagram 3), the associated coastline to these small islands and cays will generate a baseline. Naturally, this will place the adjacent coral reefs in close proximity to the baseline and therefore in Internal Waters or the Territorial Sea.⁷⁸

Further, Article 5 provides for a relationship between the low water mark along a coast and the course of the baseline. Referring once again to illustration 3A in

continental shelf does not drop away sharply beyond the coastline. Indeed, this is the situation found in Australia, where 70% of the Great Barrier Reef Marine Park lies in that state's EEZ. (P. Ottesen, *supra* n. 63 at 519). The Great Barrier Reef is obviously quite unique in its extent and, therefore, position in relation to the coast of Australia. Consequently, it may be atypical in terms of formation and location. Nevertheless, it remains significant given the proportion of the Earth's coral reefs which it contains. Further, it should be remembered that the Great Barrier Reef was one of the first PSSAs, giving Australia greater control over navigation, which would not have otherwise been available in the EEZ.

⁷⁸ Article 121 defines an Island as "*a naturally formed area of land, surrounded by water, which is above water at high tide*" and confirms that such land can generate its own Territorial Sea and Contiguous Zone. If the island can also support human habitation or economic life, then an EEZ and Continental Shelf may also be claimed. However, the ICJ in *Qatar v. Bahrain* [2001] ICJ Reports 40, felt the presence of a small island lacking vegetation and human inhabitants could be overlooked in order to arrive at an equitable determination of the maritime boundaries between the states involved.

Islands are, of course, important for another reason connected to determining maritime zones. As a variation on drawing baselines under Article 5, the presence of islands along a coast may allow a state to adopt the approach permitted under Article 7(1). This provision allows states to draw straight baselines connecting islands which fringe the coastline within its immediate vicinity. Consequently, Internal Waters will be more extensive under this rule. As has been said, the presence of coral reefs may well increase the incidence of such islands and therefore the availability of this technique for drawing baselines. Given the larger area of Internal Water which could then be claimed under this method, where adopted, this study might also expect to see an increased probability of coral reef ecosystems lying within this maritime zone.

Diagram 3, where coral reefs fringe a coastline, it is possible that parts of the reef top will be exposed at low tide. These points can therefore be used to determine the route of the state's baseline, and once again bring the adjacent coral reefs into either Internal Waters or the Territorial Sea.

There is, in addition, another provision of the LOSC which could result in a greater statistical possibility that coral reefs will be located close to baselines. Under Article 13, an area which is exposed at low tide (termed a 'low tide elevation') may generate its own baseline and maritime zones, provided the area is wholly situated at a distance not exceeding the breadth of the Territorial Sea from the mainland or of another permanently exposed island (i.e. generally, 12 nautical miles, and assumed as such in the following discussion). By way of example, and referring to the Barrier Reef illustrated as 3B in Diagram 3, such low tide elevations may well occur along reef tops. Therefore if these points lie within 12 nautical miles of the mainland coast they may generate their own baseline, and place the related coral reefs within Internal Waters or the Territorial Sea.

Even if the Barrier Reef with its low tide elevations is further than 12 nautical miles from the mainland coast, there still remains the possibility that a permanently exposed island will have formed along the reef top (see the 'dry land' indicated in illustration 3B on Diagram 3 for an example). That island will generate its own baseline and Territorial Sea, so that any low tide elevation lying within 12 nautical miles of it can then be used to construct a further baseline.⁷⁹

⁷⁹ Clearly extensive areas of coral reef may lead to a complex, cumulative application of the various rules of the LOSC for determining baselines and the delimitation of the maritime zones. For further information on this subject see Beazley, *supra* n. 71 and consider the *Qatar v. Bahrain* case *ibid*.

It is clear that because of these provisions, coral reefs can have a significant impact upon the course of baselines with the knock-on effect that there is a greater statistical probability that these marine habitats will lie in either Internal Waters or the Territorial Sea.

2.3.3 Summary

If both the provisions of the LOSC for drawing baselines, and the nature of coral reef formation, are reflected upon, this study would expect many typical coral reefs to lie close to the baselines claimed by coastal states, be they continental or island nations. Nevertheless, these can only be tentative observations in the absence of more conclusive data on the distribution of coral reefs between the various maritime zones.

2.4 CONCLUSIONS

This study's investigations into the LOSC have revealed a number of key points. Although impacting upon a wide variety of environmental issues connected to the marine environment in general, such as fishing and pollution, the LOSC contains few articles of specific relevance to the conservation of coral reef ecosystems through MPA strategies. Those articles which are of relevance can be characterised as a general framework for the conservation of these habitats. The consequences of this are that when looking at the ways in which international law encourages the use of MPAs in order to conserve coral reef ecosystems, the LOSC envisages, and promotes under Article 197, the elaboration of more detailed laws and policies under external global and regional environmental agreements. The MEAs considered in the following chapters, as well as the regional initiatives to be looked at in the second half of this chapter, are therefore potentially the most significant for the purposes of this thesis.

The LOSC was, however, potentially of importance through its provisions on the relationship between the powers of coastal and other states. The analysis of these provisions has led to a recognition that the coastal state's authority to pursue MPA strategies is more limited as it moves beyond Internal Waters towards the EEZ. Ultimately, however, the power to create MPAs, together with the ability to manage many of the activities which threaten coral reefs, did seem to favour the coastal state, with only the rights of other states to innocent passage and freedom of navigation posing a threat to the running of MPAs.

In relation to this latter concern, it was noted that in the Territorial Sea, the power of the coastal state to require ships to navigate in sea lanes for safety reasons gave rise to an effective means to regulate and even prohibit navigation in MPAs. In the EEZ, navigation was a greater problem, given that the coastal state could not regulate such activity without the approval of the IMO. However, the practical significance of this was doubted given the fact that captains would probably choose to navigate in areas away from reefs for safety reasons and in the light of the tentative conclusions provided on the likely distribution of coral reefs between the maritime zones.

Save for this, the LOSC is of limited significance to this study into the international law of MPAs and coral reefs. The fisheries provisions applicable to the EEZ are, it is suspected, only of potential relevance to a few reefs. Further, the detailed provisions on pollution, both vessel source and land-based, deal with a threat which is of limited significance to coral reefs (in the case of the former), or, in the latter case, a threat which is beyond the reach of MPAs as a conservation strategy to address, given their land-based origin. What is left is a framework within which detailed rules and regulations are expected to be developed through regional and global agreements. The latter will be considered in the remaining chapters. It is therefore important in the

remainder of this chapter to focus upon the regional seas initiatives which operate in relation to maritime waters within which coral reefs can be found.

3. REGIONAL SEAS INITIATIVES

Under Article 197 of the LOSC:

States shall cooperate on a global basis and, as appropriate, on a regional basis, directly or through competent international organizations, in formulating and elaborating rules, standards and recommended practices and procedures consistent with this Convention, for the protection of the marine environment, taking into account characteristic regional features.

During the UNCLOS III negotiations – indeed up until 1976 – the text of this article had only referred to co-operation for the prevention of marine pollution. At the 4th session of UNCLOS III this was changed so as to cover the wider task of protecting the marine environment.⁸⁰

As has previously been discussed, this provision complements the framework character of the LOSC by supporting externally concluded multilateral agreements between states, thereby establishing more focused and detailed obligations under separate treaties. Further, such conventions are envisaged as including those operational at the regional, as well as the global, level. This study, therefore, now needs to take a closer look at the regional seas initiatives which are currently active, particularly where they have led to the conclusion of such agreements.⁸¹

⁸⁰ See Nordquist, *supra* n. 23 at 77-81.

⁸¹ In this chapter, use of the term ‘agreement’ indicates that states have negotiated and concluded a binding convention or protocol. Use of the terms ‘initiative’, ‘programme’ or ‘arrangement’ are used

However, it would be inappropriate to view the LOSC as the origin of regional seas initiatives. In 1969, an agreement was concluded in Bonn for dealing with pollution of the North Sea by oil and other harmful substances,⁸² whilst the two precursor treaties to the 1992 OSPAR Convention (which covers the North-East Atlantic, the North Sea and adjacent Arctic waters) were concluded in the early 1970s.⁸³ In addition, after its establishment following the 1972 Stockholm Conference on the human environment, UNEP built upon its role in developing an action plan and agreements for the Mediterranean by endorsing a Regional Seas Programme in 1978.⁸⁴ As an approach to dealing with the marine environment, regional arrangements therefore pre-date both the beginnings of UNCLOS III and the conclusion of the LOSC. Indeed, Okidi notes that with 10 regional agreements already in place, Article 197 of the LOSC might be viewed as the codification of an existing practice.⁸⁵

As to the geographical relevance of these initiatives from the particular perspective of this study, many of the world's tropical maritime areas are covered by a regional

interchangeably and refer to the cumulative actions and output of regional groupings of states. Such initiatives, programmes or arrangements may, therefore, involve non-binding action plans, and/or have led to the conclusion of binding agreements. Further, these initiatives may have come into existence through the work of UNEP under its Regional Seas Programme, and UNEP may still be supporting these activities. Others, however, will have arisen and operate independently of UNEP.

⁸² Agreement for Co-operation in Dealing with Pollution of the North Sea by Oil and other Harmful Substances, 704 *UNTS* 3.

⁸³ The 1972 Convention for the Prevention of Marine Pollution by Dumping from Ships and Aircraft (932 *UNTS* 3) and the 1974 Convention on the Prevention of Marine Pollution from Land-Based Sources (13 *ILM* 352) were replaced by the Convention for the Protection of the Marine Environment of the North-East Atlantic, otherwise referred to as the OSPAR Convention (32 *ILM* 1068).

⁸⁴ See P. Sands, *Principles of International Environmental Law* (CUP) (2003, 2nd ed.) 399-400.

⁸⁵ C. O. Okidi, "Protection of the Marine Environment Through Regional Arrangements" (1990) 23 *L. Sea Inst. Proc.* 474 at 474.

programme. These regions are identified in the first column in Table 1. As is then clear from the second column, all but a few of the nations within whose jurisdiction it is possible to find coral reefs⁸⁶ participate in one or more of these regional initiatives.

In theory, a number of those states which do not participate in any regional initiative could do so if they so desired. Eritrea and Israel both have coastlines on the Red Sea, Brunei Darussalam in the East Asian region, and Myanmar in both the South and East Asian regions. However, engaging the remaining states who are not involved in any regional initiatives may be more difficult to achieve either for political reasons (Taiwan and the Spratley Islands), or because no programme exists for that region (Brazil). Bearing this in mind, it is still notable that so many coral reef nations are participating in regional programmes.

3.1 HOW APPROPRIATE ARE REGIONAL INITIATIVES?

Before considering these regional initiatives from this study's particular perspective of MPAs and the conservation of coral reef ecosystems, it would pay to dwell a little on the merits of the regional approach advocated in Article 197. In fact, where they can be agreed, regional conventions have traditionally received widespread support for the particular advantages they are thought to offer over global MEAs.⁸⁷

⁸⁶ The identities of these states are given in Annex I to this study.

⁸⁷ Okidi, *supra* n. 85 at 475-480; T. Treves, "Regional Approaches to the Protection of the Marine Environment", in Nordquist, Moore and Mahmoudi (eds), *The Stockholm Declaration and Law of the Marine Environment* (Kluwer Law International) (2003) 137 at 148-150; Birnie and Boyle, *supra* n. 2, at 355-6; E. Frankx, "Regional Marine Environmental Protection Regimes in the Context of UNCLOS" (1998) 13(3) *IJM&CL* 307 at 320-322.

<u>Table 1 : States Engaged in Regional Initiatives with Jurisdiction over Coral Reefs in the Region</u>	
Region	States
Wider Caribbean	Antigua & Barbuda, Bahamas, Barbados, Belize, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, France, Grenada, Haiti, Honduras, Jamaica, Mexico, Netherlands, Nicaragua, Panama, St Kitts & Nevis, St Lucia, St Vincent & the Grenadines, Trinidad & Tobago, UK, USA and Venezuela.
Red Sea and the Gulf of Aden	Djibouti, Egypt, Jordan, Saudi Arabia, Somalia, Sudan, and Yemen.
ROPME Sea Area	Bahrain, Iran, Kuwait, Oman, Qatar, Saudi Arabia, and United Arab Emirates.
Eastern Africa	Comoros, France, Kenya, Madagascar, Mozambique, Mauritius, South Africa, Seychelles, Somalia, and Tanzania.
West & Central Africa	Equatorial Guinea, and Guinea.
South Asian Seas	Bangladesh, India, Maldives, and Sri Lanka
East Asian Seas	Australia, Cambodia, China, Indonesia, Malaysia, Philippines, Singapore, Thailand, and Vietnam.
North East Pacific	Costa Rica, and Panama.
South East Pacific	Columbia, Ecuador, and Panama
South Pacific	Australia, Cook Islands, Federated States of Micronesia, Fiji, France, Kiribati, Marshall Islands, Nauru, New Zealand, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, UK, USA and Vanuatu.
North West Pacific	China, and Japan.

Frequently cited in support of this position is the point that regional agreements can improve the ability of states to react to pollution events through the creation and support of regional emergency response centres. Additionally, these treaties permit the adoption of rules more adapted to local needs⁸⁸ and in particular allow pollution regulation to be tailored to regional characteristics and threats. For example, states located close to sea lanes used by oil tankers will be concerned with discharges from these vessels, whilst industrialised coastal states might have particular needs to tackle land-based sources of pollution.⁸⁹

Other points unrelated to pollution have also been advanced to support regional agreements. Okidi, for example, argues that they are better at engaging states and inducing co-operation and commitment in matters of specific relevance to that state and area.⁹⁰ He goes on to suggest that regional agreements are more acceptable and amenable to states who are uncomfortable with the creation of global super-agencies under international MEAs,⁹¹ but who equally acknowledge that unilateral action by states beyond territorial limits is an unattractive proposition.⁹² The peace-of-mind

⁸⁸ Treves, *supra* n. 87 at 148 drawing upon ministerial declarations and preambular sections of the regional seas conventions.

⁸⁹ Note, by way of illustration, the preamble to the Convention for the Protection of the Marine Environment and Coastal Area of the South-East Pacific, 1981 (text in Lloyds of London Press: *The Ratification of Marine Conventions*, loose-leaf at II.7.430) which considers that existing MEAs on marine pollution:

do not cover all types and sources of pollution and do not completely satisfy the needs and requirements of the countries of the region.

⁹⁰ Okidi, *supra* n. 85 at 478.

⁹¹ Although not described further, this discomfort might be linked to a perceived undermining of state sovereignty perhaps through the super-agency engaging in monitoring of a state's activities.

⁹² Okidi, *supra* n. 85 at 479.

thereby engendered by regional treaties makes their negotiation conducive to agreeing more exacting commitments.

To these apparent advantages should be added the practical consequence that participation by contracting states is generally easier and cheaper under regional conventions and initiatives. Meetings are more likely to be closer to a state party's territory with the associated saving in travel costs – an important factor for the developing countries in which the majority of coral reefs are located.

However, embracing regional initiatives and agreements for the conservation of coral reef ecosystems through MPAs is not without its drawbacks. For example, it is worth bearing in mind that some of the advantages mentioned above are of limited relevance to the conservation of these habitats through MPA strategies since pollution from both land and sea based activities are either of limited importance to coral reefs or outside the influence of MPAs. In addition, regional political tensions may be more apparent within the smaller fora operating under such initiatives, as opposed to being dissipated in the large scale proceedings of global meetings.

Perhaps more fundamentally, the author questions the appropriateness of regional agreements and action plans for conserving and protecting coral reef ecosystems as a matter of principle. This is linked to this study's earlier acknowledgment of the international community's standing on the conservation of coral reef ecosystems and the duty of states to conserve these habitats – which would otherwise fall simply under the unfettered sovereignty and control of the state – both of which are partly linked to the principle of the common concern of mankind.⁹³

⁹³ See Chapter 5.

Regional action taken by the parties to regional agreements will undoubtedly have the potential to contribute to the conservation of coral reef ecosystems in accordance with the international community's interest. The difficulty is ensuring that these measures are exposed to the scrutiny and opinions of all those who, because of the principle of common concern, are recognised as having legitimate standing and interest in the issue. Problematically, membership of regional initiatives and conventions may by design, or as a result of practice, operate within a select group of countries. For example, this is the case for the Red Sea and Gulf of Aden agreement which is designed to have a limited membership.⁹⁴ It is this which seems so fundamentally at odds with principles under today's international environmental law.

It is therefore important to encourage the involvement of the international community in alternative ways given the limitations on the make-up of contracting parties. For example, the regional agreements could actively participate and be encouraged to engage with the global MEAs. In particular given the scale of its engagement with the global community, regional secretariats could attend conferences of the parties to the Convention on Biological Diversity in order to report on their work and field enquiries.⁹⁵ Only a few are currently taking such steps, namely the Mediterranean and South Pacific regions.⁹⁶ Conversely, secretariats of the global MEAs, international NGOs or even non-party states could be encouraged to attend conferences of the parties to the regional agreements. Whether this is already a widespread practice is far from clear given the difficulty in obtaining records of such conferences, but examples

⁹⁴ Under Articles XXV and XXVI, only states invited to the conference of plenipotentiaries that negotiated the convention, and Arab League member states, may become contracting parties.

⁹⁵ This could simply take the form of a stand at the conference, rather than through observer status.

⁹⁶ In relation to the Convention on Biological Diversity, the Mediterranean Region was present at COPs 5 and 7, whilst the South Pacific sent representatives to COPs 1, 2, 4 and 6.

can be found of Greenpeace and the Ramsar Secretariat attending meetings convened under the convention and protocols applicable in the Wider Caribbean region.⁹⁷ Increasing awareness of the importance of such steps in order to safeguard international interests under the common concern of mankind is arguably important if regional initiatives are to be supported.

Finally, another significant problem posed by regional initiatives arises as a consequence of the geographical exclusion of states. It has long been recognised that the conservation of habitats, fauna and flora is particularly dependent upon capacity building, information exchange and technology transfer for the benefit of developing countries, upon whom the burden of such conservation often falls. Such actions are key to enhancing compliance with, and enforcement of, international environmental law and meeting environmental objectives. Ensuring the membership and co-operation of developed states under MEAs is widely recognised as important for enabling such financial, technological and educational support. By design or practical effect, particular regional agreements and initiatives exclude many developed countries and therefore restrict the potential for such capacity building. To an extent, Global Environment Facility ("GEF") grants may alleviate this issue; grants of US\$767 million were made between 1991-2004 by the GEF to fund projects under its International Waters Focal Area, a large number of which related to regional projects.⁹⁸ In addition, there seems little to prevent separate regional programmes from entering into co-operative arrangements, which could open up access to capacity

⁹⁷ Greenpeace and Ramsar sent representatives to the 6th Conference of the Parties to the Cartagena Convention.

⁹⁸ Data available at www.gefweb.org.

building resources.⁹⁹ However, there is some evidence from the regional initiative concerning protection of marine turtles in the Indian Ocean (especially when compared to that dealing with marine turtles in the West African region) which suggests that this initiative has thrived and performed better with direct access to its own funds, resources and expertise – which have largely flowed from participating developed states.¹⁰⁰ The exclusion of developed states, by design or for geographic reasons, may therefore weaken the potential of a regional initiative to meet its objectives.

3.2 PROGRESS WITHIN REGIONS

Regional initiatives might not therefore be so immediately appropriate for the conservation of coral reef ecosystems. That said, a number of regional initiatives do exist which, as indicated in Table 1, also have a bearing upon the conservation of these habitats. Progress made to date in terms of the way in which they utilise binding legal commitments to promote the conservation of coral reef ecosystems through MPAs, however, varies considerably. In some of these regions, little progress has been made beyond agreeing an action plan, intended to guide future activities but without the constraints of a legally binding convention. In others, progress has advanced beyond action plans so as to generate a framework convention for protecting the maritime environment in a given region, as well as a more focused protocol on employing protected areas towards conservation goals. This disparity between the regions which cover areas where coral reefs form is illustrated in Diagram 4.

⁹⁹ For example, the OSPAR and Baltic Seas Regional Programme adopted a joint work programme on MPAs in June 2003 – details available at www.ospar.org/eng/html/strategies/strategy-01.html.

¹⁰⁰ See Chapter 10.

Diagram 4 : Progress Under the Regional Initiatives in Maritime Areas Containing Coral Reef Ecosystems

Region	Regional Action Plan Adopted	Framework Convention		Protocol on Protected Areas		
		Agreed	In Force	Draft	Agreed	In Force
South Asian Seas						
East Asian Seas						
North West Pacific						
North East Pacific						
West & Central Pacific						
South Pacific						
ROPME						
Red Sea & Gulf of Aden						
South East Pacific						
Eastern Africa						
Wider Caribbean						

Developments in the Wider Caribbean are perhaps the most advanced, given that the protocol on protected areas has been in force for a few years, and the parties are in the stage of issuing guidelines for managers to aid implementation of the protocol's terms. This region shall therefore be used as a touch-stone for exploring the nature and progress under regional programmes for encouraging MPAs as a strategy for conserving coral reef ecosystems. This will be done through addressing the three common stages in the development of the law in this field – action plans, framework agreements and specific protocols on protected areas.

3.3 DEVELOPING AND AGREEING ACTION PLANS

The first step in developing a new regional initiative commonly involves convening a conference of the nations in a given region in order to adopt a plan of action to guide activities for protecting and conserving the local marine environment. By way of illustration, development of the action plan for the Wider Caribbean began in 1977 with UNEP working in association with the Economic Commission for Latin America. Through co-operation with local specialists, a draft Action Plan was drawn up for consideration at meetings of government nominated experts in February 1980 and the same month the following year. The plan itself was soon agreed and ready for adoption. This took place at an inter-governmental meeting held in April 1981 in Montego Bay, Jamaica.¹⁰¹ Such an approach might be varied through regularly renewing action plans, as is the case for the South Pacific region.

¹⁰¹ Details of the development of the action plan (and its full text) can be found in the preface to UNEP, *Action Plan for the Caribbean Environment Programme: Regional Seas Reports and Studies No. 26* (1983) at i-ii.

As Birnie and Boyle recognise,¹⁰² the action plans adopted have tended to follow a similar structure and make provision for environmental assessment, management, legislation, and institutional and financial arrangements. The action plans also set out overall objectives, as well as indicating the geographical extent of the region within which the programme of action will operate.

Again, the Wider Caribbean region can be used as a means to illustrate this.¹⁰³ The objective of the Action Plan for the Caribbean Environment Programme (the “CAP”) is to minimize environmental problems in the region through assessment of their nature and seriousness, and developing environmental management strategies in response.¹⁰⁴ The geographical limits of this plan were defined as the insular and coastal States and Territories of the Caribbean Sea and the Gulf of Mexico, plus the Bahamas, Guyana, Suriname and the French Department of Guiana, together with the Atlantic Ocean adjacent to these States and Territories.¹⁰⁵ That said, the action plan does allow for other states to participate; a fact highlighted in the provisions on sources of potential financial support.¹⁰⁶

The CAP lays particular emphasis upon better assessment of the marine environment in the area, as well as developing management plans, guidelines and projects. Three components are then highlighted, these being:

¹⁰² Birnie & Boyle, *supra* n. 2 at 358.

¹⁰³ Other regional plans adopt a similar approach. For example, the North-West Pacific action plan has adopted a number of goals and objectives (ranging from halting further degradation of the coastal and marine environment, to long term sustainable use of marine and coastal resources) and some specific activities to meet these goals such as the establishment of a regional collaborative monitoring programme.

¹⁰⁴ CAP para 4.

¹⁰⁵ CAP para 2.

¹⁰⁶ CAP paras 2 and 72.

- Education, training and development of human resources;
- Supporting measures, namely institutional and financial arrangements; and
- Environmental assessment and management of pollution, fisheries, coastal zones, watersheds, natural disasters, energy, human settlement, tourism and environmental health.¹⁰⁷

The last of these components includes some specific recommendations with a bearing upon MPAs and coral reefs. For example, the plan stipulates that an inventory and monitoring programme of environmental resources should be developed with a particular focus on coastal and marine areas such as coral reefs.¹⁰⁸ Management plans should also involve catalysing the restoration of degraded reefs.¹⁰⁹ Further, the plan envisages action being taken to develop regional and subregional networks of coastal, marine and terrestrial protected areas to help maintain natural resources of importance to development¹¹⁰ with a survey conducted to identify potential areas for parks which could support tourism whilst also protecting fragile ecosystems and areas of scientific interest.¹¹¹

3.4 FRAMEWORK CONVENTIONS

Significantly, these expressions of intent and concerted action found in plans of action have more often than not been bolstered and supported by the conclusion of a

¹⁰⁷ The latter covers issues such as water supply and food contamination.

¹⁰⁸ CAP para 11.

¹⁰⁹ CAP para 21(b).

¹¹⁰ CAP para 15(e).

¹¹¹ CAP para 40.

number of legal agreements. This legal structure commonly takes the form of an overarching framework convention, supplemented by the development and adoption of more focused protocols. Diagram 4 illustrates which regions have agreed such a framework convention, and those which have entered into force. Further, like the action plans, these framework treaties bear a number of similarities. The Caribbean Framework Convention shall be discussed in detail, but differences between its provisions and those of the other regions which cover coral reef habitats will be highlighted.

The Cartagena Convention for the Protection and Development of the Wider Caribbean Region (the “Cartagena Convention”)¹¹² was opened for signature on the 24th March 1983 and entered into force on 11 October 1986. This was neither the first, nor the most recent of such agreements to be agreed and enter into force and which are relevant to this study. The Kuwait Regional Convention for Co-operation on the Protection of the Marine Environment¹¹³ which applies to the Regional Organization for the Protection of the Marine Environment (“ROPME”) regional programme (principally covering the Persian Gulf and Gulf of Oman), was agreed in 1978 and entered into force just one year later. Similar framework conventions for the Red Sea and Gulf of Aden,¹¹⁴ South-East Pacific,¹¹⁵ and West and Central African¹¹⁶

¹¹² 22 ILM 221

¹¹³ 1140 UNTS 133.

¹¹⁴ 1982 Regional Convention for the Conservation of the Red Sea and the Gulf of Aden, 9 EPL 56 – in force 1985.

¹¹⁵ 1981 Convention for the Protection of the Marine Environment and Coastal Area of the South-East Pacific, translated text available in Lloyds of London, *The Ratification of Marine Conventions*, II.7.430 – in force 1986.

¹¹⁶ 1981 Convention for Co-operation in the Protection and Development of the Marine and Coastal Environment of the West and Central African Region, 20 ILM 746 – in force 1984.

regions also pre-date the Cartagena Convention, whilst conventions for the Eastern African,¹¹⁷ South Pacific¹¹⁸ and North East Pacific¹¹⁹ regions have been subsequently concluded with the latter yet to enter into force.

Like the action plans, these conventions do address the question of participation. Turning to the Cartagena Convention first, whilst that convention is drafted in a manner which would allow all states to become contracting parties,¹²⁰ in effect membership has remained limited to those states and regional economic integration organizations which were invited to participate in the final Conference of Plenipotentiaries held in Cartagena from 21st to 24th March 1983, plus St Kitts and Nevis which gained independence in September 1983.¹²¹ Expectations as to the potential membership therefore appear to be focused upon the EU, France, the Netherlands and the UK plus 25 other states in the region.¹²² It is worth noting that 25 of these states exercise jurisdiction over coral reefs in the region, although only 21 have so far ratified the convention.

A similar approach has been adopted by the South Pacific region in their framework convention, although states who were not invited to participate at the originating plenipotentiary meeting, but who wish to accede to the treaty, must first receive the

¹¹⁷ 1985 Convention for the Protection, Management and Development of the Marine and Coastal Environment of the Eastern African Region, *IELMT* 985:46 – in force 1996.

¹¹⁸ 1986 Convention for the Protection of Natural Resources and Environment of the South Pacific Region, 26 *ILM* 38 – in force 1990.

¹¹⁹ 2002 Convention for Co-operation in the Protection and Sustainable Development of the Marine and Coastal Environment of the North East Pacific, text available at www.unep.ch/regionalseas.

¹²⁰ The framework convention for the North East Pacific mirrors the Cartagena Convention in the manner in which it determines the potential composition of the contracting parties, in Arts. 21, 22, 23.

¹²¹ Cartagena Convention Art. 26.

¹²² See www.cep.unep.org/law/cartstatus.

approval of three-fourths of the parties to the convention.¹²³ In comparison, other conventions are even more restrictive in their membership criteria. The ROPME region limits membership to the states invited to the originating conference of the convention,¹²⁴ whilst the Red Sea and Gulf of Aden Convention follows suit but with allowance also being made for members of the Arab League to become contracting parties.¹²⁵

As noted earlier, such provisions and practical consequences throw up particular concerns surrounding the interests of the international community based upon the principle of the common concern of mankind. The practical exclusion of many states therefore demands that consideration be made to involving the international community through alternative channels.

In terms of content, the framework conventions pay particular attention to pollution control, particularly in comparison to obligations surrounding general conservation and protected areas. This is clear from the provisions of the Cartagena Convention. Article 4 states that, as a general obligation, the contracting parties shall take all appropriate measures to prevent, reduce and control pollution in the convention's area. The following five articles are then dedicated to various sources of pollution, whilst Articles 11 and 14 deal with emergency responses to pollution events and liability and compensation for pollution, respectively.

Of course, such a focus on pollution might be predictable. It has already been noted that pollution issues are well served by regional initiatives. However, this level of

¹²³ *Supra* n. 118 Arts 28, 29 and 30. The same mechanism is also used by the Eastern African region, *supra* n. 117 Arts 26, 27 and 28.

¹²⁴ *Supra* n. 113 Arts XXVI and XXVII.

¹²⁵ *Supra* n. 114 Arts. XXV and XXVI.

detail contrasts with the treatment of the conservation of biodiversity, habitats, fauna and flora under the framework conventions. For instance, all of the framework conventions (with the exception of the ROPME agreement, which is silent) only impose some form of general obligation upon the contracting parties to take appropriate measures for the sound management of natural resources.¹²⁶ Some of the conventions do add to this via an article specifically dealing with conserving rare and fragile habitats and protected areas. For example, the Cartagena Convention imposes upon contracting parties an obligation to take all appropriate measures to preserve and protect rare or fragile ecosystems, plus habitats of depleted, threatened or endangered species in the region. Specifically towards this goal, states should endeavour to establish protected areas, and exchange information on their administration and management.¹²⁷

Such obligations are supportive of the need to conserve coral reef ecosystems through MPAs, although it is clear from the framework conventions concluded to date for regions containing coral reef ecosystems that their obligations are at best general, requiring support from more detailed, supplementary agreements. The potential of such focused agreements is clearly demonstrated when the strengths and detail of the few protocols on protected areas which have been concluded to date in relevant regions are considered.

¹²⁶ This obligation is, on occasions, only to be pursued by contracting parties with their best endeavours. See the conventions relating to the South East Pacific and South Pacific regions.

¹²⁷ Cartagena Convention, Art. 10. See also the conventions for the Eastern African, North East Pacific, and South Pacific regions.

3.5 PROTOCOLS FOCUSED UPON PROTECTED AREA STRATEGIES

Protocols focused upon protected areas exist in three of the regions of relevance to this study. These are the Wider Caribbean (the “SPA Protocol”),¹²⁸ Eastern Africa (the “Nairobi Protocol”),¹²⁹ and the South East Pacific (the “Paipa Protocol”).¹³⁰ In addition, drafting of protocols covering protected areas is currently under way in the Red Sea and Gulf of Aden region, as well as in the ROPME region.¹³¹ Interestingly, the framework conventions for the South East Pacific, the Red Sea and Gulf of Aden, and the ROPME regions do not contain any specific article obliging contracting parties to create protected areas. The first two do, however, include a general obligation to use natural resources wisely, though even this type of obligation is missing from the ROPME framework convention. Consequently, it could be argued that the negotiation and adoption of protocols concerning protected areas need bear little correlation to the contents of the relevant earlier parent conventions.

Turning to the content of the three protocols adopted to date, it is apparent that a commendable level of detail has been achieved in the obligations of the state parties, as well as a comprehensive approach to conservation through enclave strategies. This is clearest if this study focuses once again upon the Wider Caribbean agreement. The SPAW Protocol was adopted at Kingston, Jamaica on 18 January 1990. Like the

¹²⁸ 1990 Protocol Concerning Specially Protected Areas and Wildlife to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region. Text available at www.cep.unep.org.

¹²⁹ 1985 Protocol Concerning Protected Areas and Wild Fauna and Flora in the Eastern African Region, *IELMT* 985:47

¹³⁰ 1989 Protocol for the Conservation and Management of Protected Marine and Coastal Areas of the South-East Pacific. Translated text available in Lloyds of London, *The Ratification of Marine Conventions*, at II.7.442.

¹³¹ English translations of these drafts were not available at the time of writing.

Cartagena Convention, the protocol was designed to enter into force on the thirteenth day following the ninth ratification, acceptance, approval or accession.¹³² Ten years later the Government of St Lucia became the ninth government to ratify the protocol, which then duly entered into force on 18 June 2000.

David Freestone, who acted as a member of the delegation for Antigua and Barbuda at all three of the meetings convened to negotiate the protocol, has described the SPAW as:

... arguably the most comprehensive regional wildlife protection treaty in the world – it is certainly the most comprehensive of its kind... [reflecting] much of the best in modern thinking on wildlife protection and management.¹³³

The merits of this opinion, particularly from this study's perspective of the conservation of coral reefs and MPAs, will become clearer as the provisions of the protocol are considered. More practical issues, such as membership of states and progress made in implementing its terms, will also need to be covered.

That the SPAW is in step with modern thinking in environmental law can be seen quite early on in the agreement's text. Since the protocol was negotiated in the late 1980s and concluded in 1990, it was drawn up in the light of the growing support for sustainable development as a principle of international environmental law. Naturally, the protocol looked to reflect this trend, as indeed did the Nairobi Protocol¹³⁴ and

¹³² SPAW, Art. 27 and Cartagena Convention Art. 28(2).

¹³³ D. Freestone, "Specially Protected Areas and Wildlife in the Caribbean – The 1990 Kingston Protocol to the Cartagena Convention" (1990) 5(4) *IJE&CL* 362 at 368.

¹³⁴ Nairobi Protocol, Art. 2(1).

Paipa Protocol.¹³⁵ The preamble to the SPAW, therefore, recognizes that the protection and maintenance of the environment of the region is essential towards its sustainable development whilst Article 3 establishes the general obligation that protected areas will be managed sustainably.

Other examples of the modernity of the protocol will be encountered as provisions after the preamble are also analysed. First, however, the definitions clause needs to be noted, since it effects an important change from the structure which was established for the region under the parent convention. Article 1(3) adopts the same meaning for the Wider Caribbean Region as was used for “convention area” under the earlier framework agreement but with an important extension. The protocol also applies to waters on the landward side of the baseline from which the breadth of the Territorial Sea is measured (i.e. Internal Waters) and up to the fresh water limit. The parent convention specifically excludes Internal Waters. Whilst the protocol’s approach is therefore to be welcomed for extending its jurisdiction into waters which may well contain coral reefs (as was discussed earlier in relation to the LOSC), it does lead to jurisdictional inconsistency over this matter between the general obligation to create protected areas under Article 10 of the Cartagena Convention and the SPAW’s provisions. Given that not all contracting parties to the framework convention have so far joined the SPAW, this divergence cannot be ignored.¹³⁶

The three protocols, like their parent framework conventions, set out general obligations. The SPAW does this in Article 3 whereby each party is required to take the necessary measures to protect, preserve and manage in a sustainable manner areas

¹³⁵ Paipa Protocol, Art. II.

¹³⁶ Similar provisions exist under the Nairobi Protocol, whilst the position for the South-East Pacific is less clear in the English translation through references to ‘sea’ and ‘coastal’ areas.

that require such protection to safeguard their special value, as well as threatened or endangered species of flora and fauna.¹³⁷ The parties to the SPAW are expected to regulate and, where necessary, prohibit activities which threaten to adversely affect these areas and species. This highlights the dual focus of the SPAW – which is repeated in the Nairobi Protocol, but omitted in the Paipa Protocol – upon both habitat protection within enclaves and conservation of wildlife. This study will naturally focus upon the first of these in its consideration of the protocols' articles.

Uniquely amongst the protected area protocols, the SPAW has a two-tier design for enclaves within the Wider Caribbean region. Like the Nairobi and Paipa protocols, the general idea under the SPAW is that contracting parties should be establishing protected areas in marine waters.¹³⁸ However, the SPAW then plans for some of these enclaves to be nominated and assessed for inclusion in a list to reflect their significance within the region.¹³⁹ Before looking at the listing of protected areas under the SPAW, the generally applicable provisions under that protocol will be considered first, noting that references to protected areas will predominantly apply to marine protected areas.

The SPAW requires contracting parties to establish protected areas when necessary in order to sustain the natural resources of the region, and to encourage ecologically sound and appropriate use, understanding and enjoyment.¹⁴⁰ The protocol then gives guidance on the types of sites which should benefit from such enclave strategies, namely:

¹³⁷ SPAW Art. 3(1).

¹³⁸ SPAW Art. 4.

¹³⁹ SPAW Art. 7.

¹⁴⁰ SPAW Art. 4(1).

- Representative types of coastal and marine ecosystems;
- Habitat and associated ecosystems of threatened, endangered or endemic species;
- Areas that provide economic or social benefits upon which local inhabitants depend; and
- Areas of special biological, ecological, educational, scientific, historic, cultural, recreational, archaeological, aesthetic or economic value, particularly where these areas are essential to the functioning of the region's ecosystems.¹⁴¹

Clearly the Protocol is drafted in terms more than capable of demanding due coverage of Caribbean coral reefs, given the aesthetic, economic, biological and representative values of these ecosystems to the region. This study would therefore expect the SPAW to be encouraging and ensuring that contracting parties are using MPA strategies to conserve coral reef ecosystems.

The same can be said in relation to the Eastern African region – another area where coral reefs flourish along the coastline. The Nairobi Protocol states that in establishing protected areas, the contracting parties should take account of the area's importance as, *inter alia*, a rare or fragile ecosystem and in the maintenance of stocks of economically important marine species.¹⁴² In contrast, the Paipa Protocol leaves it to the contracting parties to develop their own criteria for determining which areas to include within enclaves,¹⁴³ although it does seem to suggest that, *inter alia*,

¹⁴¹ SPAW Art 4 (2)(a)-(d).

¹⁴² Nairobi Protocol, Art. 8(3).

¹⁴³ Paipa Protocol, Art. IV.

ecological, economic, tourism and aesthetic values should lie at the heart of these criteria.¹⁴⁴ In summary, the Nairobi Protocol and, potentially, the Paipa Protocol also seem to be drafted in a way which would encourage creating MPAs to aid conservation of coral reefs.

Returning to the SPAW Protocol, in the light of the particular characteristics of the area involved, and national laws and regulations, Article 5 obliges contracting parties to progressively take measures which are necessary and practicable to meet the objectives set for the protected area. Again, the SPAW goes on to highlight the type of measures which should be considered. Many of these are particularly important for coral reefs, such as regulating or prohibiting fishing or harvesting of endangered or threatened species, prohibiting destructive practices likely to harm or disturb habitats, the regulation of tourist or recreational activities which might threaten ecosystems within protected areas, and regulation of land based activities causing pollution. Recalling this study's original considerations of the threats currently faced by coral reefs, the emphasis on these issues highlights just how well the SPAW does indeed reflect modern conservation needs for coral reefs. It also represents a level of detail which, as will be seen, is rarely found in global international environmental agreements with a bearing upon coral reef ecosystems and MPAs.

This eye for detail and reflection of good practice in managing protected areas for the conservation of coral reefs is also found in the Nairobi and Paipa Protocols. They too state that tourism, fishing and destructive activities should be regulated.¹⁴⁵ To this extent, the three protocols are to be commended.

¹⁴⁴ Paipa Protocol, Art. III.

¹⁴⁵ See Paipa Protocol, Art. V, and Nairobi Protocol, Art. 10.

Praise should also be given to the SPAW for the obligations concerned with planning, management and enforcement of regulations in protected areas. The adoption and implementation of such measures, as noted in Article 6 to the SPAW, are important for maximising the benefits of protected areas and helping to meet the protective measures which a state recognises are needed. A list of suggested measures to be taken in this field are listed in Article 6(2) and include drafting management guidelines, involving local communities in planning and management, permit systems, monitoring of the protected habitats and species, educational programmes and raising public awareness towards increasing appreciation and understanding of protected areas and the purposes for which they are established.

The SPAW, Paipa Protocol and Nairobi Protocol all draw the parties' attention to the possible need to strengthen the level of protection offered to an enclave through developing buffer zones with less restrictive management plans, whilst all bar the last require environmental impact assessments for projects which might have a negative impact upon a protected area.¹⁴⁶ Again, provisions like these underline the modern thinking reflected in the protocols' drafting.

A feature common to both the SPAW and Nairobi Protocol, and notably absent from the Paipa Protocol, are obligations relating to changing the boundaries of protected areas. Whilst the Paipa Protocol merely requires states to notify other parties of changes to the boundaries of protected areas,¹⁴⁷ the other two seek to limit the circumstances in which contracting parties may take such action. Article 15 of the SPAW seeks to reinforce the designation of protected areas by stating that changes in the delimitation or legal status of an enclave may only take place for significant

¹⁴⁶ SPAW, Art. 8 and 13; Nairobi Protocol, Art. 11; Paipa Protocol, Art. VI and VIII.

¹⁴⁷ Paipa Protocol, Art. III.

reasons. Wording to the same effect is deployed in the Nairobi Protocol.¹⁴⁸ Such drafting will be encountered once again when the other MEAs which impact upon coral reefs are considered.¹⁴⁹ In this instance, though, it is worth noting that the SPAW and Nairobi Protocol fall short in not requiring compensatory measures to be put in place should such significant reasons for changing boundaries or legal status arise.

Finally, a further common feature of the protocols which have so far been considered is the need to report to the other contracting parties through the secretariat body to the agreement. For example, Article 19 of the SPAW obliges the contracting parties to report periodically to the secretariat on issues such as the status of existing and newly created protected areas and buffer zones within the reporting state's jurisdiction, along with information on changes in the delimitation or legal status of protected areas, management plans for enclaves and threats to areas. Such reporting is important as a mechanism for enhancing compliance with the protocol's obligations, and is a welcome inclusion in the agreement. Unfortunately, however, more detail needs to be provided to make the reporting function meet its full potential, not least with respect to setting out a timetable for submitting these reports.

The vast majority of these articles go some way towards underlining the potential of the SPAW, Nairobi Protocol and Paipa Protocol for promoting MPAs and effective management of enclaves for the coral reefs in these regions. However, the SPAW

¹⁴⁸ Nairobi Protocol, Art. 20.

¹⁴⁹ It was noted in Chapter 4 that the effects of global warming might require a degree of flexibility in the operation of MEAs for allowing boundary adjustments to protected areas. This was because a degree of migration in habitats, flora and fauna is expected. Nevertheless, such flexibility to allow for such events should still require the contracting party to maintain some form of enclave. Further, the extent to which such re-distribution will occur for coral reefs was also questioned in Chapter 4.

protocol is particularly notable for deploying a further mechanism for enhancing the management of MPAs in the region which is not used by the other two protocols, and which seems to have been designed after considering similar approaches under the World Heritage Convention and the Ramsar Convention – MEAs which will be considered in detail later on in this study. It involves the establishment of a list of particularly important protected areas for the region, which also derive some added cachet through the recognition of, and approval for listing from, an independent panel.

The listing mechanism underpins the express desire of the contracting parties to create a regional network of protected areas.¹⁵⁰ This network will comprise areas of particular importance to the Wider Caribbean region. The stated consequences of listing are that these sites will merit priority attention with respect to scientific and technical research, as well as priority receipt of support through assistance from the contracting parties. Of course, side benefits are offered which flow from listing schemes which will also benefit these sites. For example, listing results in the site being (metaphorically) raised higher above the parapet, exposing its management and state of conservation to increased scrutiny from third parties. This in turn can strengthen the position of environmental ministries at the national level when it comes to determining government policy and inter-departmental support. In return for such priority support, the SPAW states that the parties must not authorise or undertake any activities which would undermine the purposes for which a listed area was created.¹⁵¹

¹⁵⁰ SPAW, Art. 7(2).

¹⁵¹ *Ibid.*

According to Article 7(3), nominations for the list are due to be made in accordance with guidelines and criteria to be adopted by the contracting parties. Whilst the drafting of these guidelines is at an advanced stage, the contracting parties have yet to adopt a final document. The latest available draft does, however, give some indications as to the likely content of these guidelines and therefore more detail on the desired list and network.¹⁵² In a move which resembles the approach adopted by the World Heritage Convention, the draft guidelines list a number of criteria by which nominated sites will be judged. Some of these criteria must be met, whilst others which are satisfied by a nominated site will have a cumulative affect contributing towards strengthening that site's eligibility for the list. These criteria fall into three broad categories: (1) ecological, cultural and socio-economic; (2) legal; and (3) protection, planning and management. From these, the compulsory criteria to be met include:

- (i) the area must be of sufficient size to ensure the conservation of the elements for which it is listed and help prevent species becoming endangered or threatened;¹⁵³
- (ii) the protected area must have a legal status guaranteeing its effective long-term protection;¹⁵⁴ and
- (iii) the area must have a management framework and mechanisms for implementation which include clearly specified legal, institutional and protective measures applicable within the enclave, a

¹⁵² *Final Draft – Guidelines and Criteria for the Evaluation of Protected Areas to be Listed Under the SPAW Protocol*, UNEP(DEC)/CAR WG.29/3 dated 10 August 2005.

¹⁵³ *Ibid*, Part B (Ecological Criteria) (b) and (c).

¹⁵⁴ *Ibid*, Part C.

management body with due authority and means to manage the site, clearly defined conservation and management objectives, and a research and monitoring programme for assessing progress towards conservation goals.¹⁵⁵

The supporting criteria which strengthen the protected area's claim for inclusion in the List include:

- (a) involvement of stakeholders and local communities in planning and management of the protected area;¹⁵⁶
- (b) due consideration within management plans and frameworks for raising public awareness and enhancing education with respect to protected areas and the conservation objectives;¹⁵⁷
- (c) the area's contribution to conserving, maintaining or restoring natural resources used by fishermen or sectors such as tourism;¹⁵⁸
- (d) notable resilience of biological components within the enclave for recovering from disturbances, such as climate change, which could help with the recovery of other damaged ecosystems;¹⁵⁹
- (e) high degree of naturalness exhibited as a result of no or low level anthropogenic disturbance, or the presence of a high degree of biological diversity;¹⁶⁰ and

¹⁵⁵ *Ibid*, Part D. I (a) and (b) and Part D. IV (c).

¹⁵⁶ *Ibid*, Part D. III.

¹⁵⁷ *Ibid*, Part D. IV (b).

¹⁵⁸ *Ibid*, Part B (Cultural and Socio-Economic Criteria)

¹⁵⁹ *Ibid*, Part B (Ecological Criteria) (i).

(f) the rarity of species, habitats or ecosystems found within the protected area, or the importance of the habitat within the area for endangered, threatened or endemic species¹⁶¹

Whilst it may be no real surprise to encounter such modern conservation thinking within these criteria given the fact that the guidelines are being negotiated in the 21st century, it is worth once again highlighting this modernist characteristic of the SPAW protocol. In addition, these criteria go a long way towards defining those features of a site's characteristics and management which render it of such importance to the Wider Caribbean so as to merit its listing and integral role within the desired network of protected areas.

The next stage in the listing process seems less than clear from the terms of the protocol and the latest draft guidelines. Article 7(3)(b) of the protocol states that it is for the Scientific and Technical Advisory Committee ("STAC") to the SPAW to assess the nomination and supporting documents. The committee will then advise UNEP (as the secretariat to the protocol) as to whether the proposed site meets the guidelines and criteria. The protocol then states:

If these guidelines and criteria have been met, [UNEP] will advise the Meeting of Contracting Parties who will include the nomination in the List of Protected Areas.

The implications of this seem to be that the meeting of the contracting parties is simply an opportunity to rubber stamp the recommendation of the STAC, a

¹⁶⁰ *Ibid*, Part B (Ecological Criteria) (e) and (g).

¹⁶¹ *Ibid*, Part B (Ecological Criteria) (d) and (f).

possibility given further credence by Article 23(2) on the functions of the Meeting of the Parties which limits their role in this regard to one of analysis and:

(e) to monitor and promote the establishment and development of the network of protected areas and recovery plans... provided for in [Article] 7...

In reality, however, control over the contents of the list may still lie with the contracting parties. Given that the membership of the STAC is made up of one scientific expert appointed by each contracting party as its representative,¹⁶² who may in turn be accompanied to STAC meetings by other advisors and experts, the opportunity seems to exist for states to influence the make up of the list of sites before the involvement of the Meeting of the Parties. Of course, with the listing mechanism yet to be finalised and put into operation, any analysis of how Article 7(3)(b) plays out in practice must be put off, particularly as the foregoing issue will turn upon the voting arrangements for nominated sites.

The inclusion of a listing mechanism is to be welcomed given the added benefits that membership of such lists can bring to the management of protected areas. Further, the protocol has clearly defined the aim of the list, namely to create a network. According to the draft guidelines, whilst no limit is set as to the number of sites which may make it onto the list, the network aimed for should be comprehensive and representative across all bioregions and ecosystems. Again the SPAW should be commended for having set itself such a defined goal towards which action and monitoring can be focused. This is again further supported through detailed guidelines reflective of much modern thinking in wildlife and habitat conservation.

¹⁶² The individual must be an expert in protected areas. SPAW Art. 20(2).

Having completed a review of the principal elements in the drafting of these three protocols', it becomes necessary to review progress and any implications for coral reefs. To a large extent, the ability to do this is limited through a lack of data, since records of meetings under the protocols are incomplete or unavailable, particularly in relation to the Paipa and Nairobi Protocols. Assessing progress under the SPAW protocol is a little easier, although records remain incomplete and no lists of protected areas have yet been formed given the draft stage of the guidelines for drawing up such inventories. This study will begin by considering membership.

Whilst this study has been able to commend the SPAW for the substance of its provisions, it is disappointing to find that few states have yet ratified the agreement, particularly in comparison to the Nairobi and Paipa protocols which have achieved full participation. Of course, the Wider Caribbean comprises far more states than these two regions, and there is often a correlation between agreements containing more demanding and detailed obligations with willingness on the part of states to become parties. Indeed, it took the SPAW 10 years to enter into force, despite only requiring nine ratifications. To date, 15 states have signed the agreement, and only 12 have proceeded to ratify or accede to its terms. Whilst all of these states are host to coral reefs, a number of countries with some of the largest distributions of coral reefs in the region have failed to sign, ratify or accede to the agreement. Notable absentees include Belize, the Bahamas and Mexico. The poor membership suggests a lack of commitment regionally to the agreement, with all of the attendant problems this poses to making meaningful progress in implementing its provisions. Fortunately the United States, France and the Netherlands have become contracting parties, thereby opening up the possibility of the protocol being able to draw upon the capacity of these

developed states to support its operation. Clearly, however, membership is a key issue for the SPAW requiring focused action.

Given the above, coupled to the recent entry into force of the protocol, it is none too surprising to find that progress under the SPAW has been less than satisfactory. The list of protected areas has yet to be created and, as was discussed earlier, the guidelines for doing so are still being discussed. The one further disappointment of note is that guidelines on management and planning for protected areas, which are called for under Article 6, have yet to be finalised.¹⁶³

3.6 CONCLUSIONS ON THE CONSERVATION OF CORAL REEFS THROUGH REGIONAL ARRANGEMENTS

Regional associations, initiatives and agreements exist for many of the areas of the globe where coral reef ecosystems form and flourish. The manner in which these regional arrangements promote the conservation of coral reefs through protected areas is highly varied. Progress in the regions shows marked differences with some of the most important regions for coral reefs having progressed little beyond action plans. Three regions however, and particularly the Wider Caribbean region, have demonstrated the potential of regional initiatives in concluding protocols under framework conventions which contain detailed obligations based upon modern scientific thinking for the promotion of conservation through MPAs. The Wider Caribbean region shows the most progress in this regard, having developed guidelines for the creation of a list of significant protected areas. Given that this region is a

¹⁶³ The completion of guidelines on managing protected areas was first called for under Decision IV of the first COP to the SPAW, and remains an outstanding matter.

particularly important area for coral reefs, the existence and nature of this regional legal initiative is to be welcomed and applauded.

Unfortunately, such progress is not uniform, nor do regional initiatives necessarily represent the best way to mobilise international support or reflect the global community's interest in conserving coral reefs. Even where progress has been commendable, the inevitable conclusion, particularly when considering the SPAW, is that agreements have been created which offer significant potential for the conservation of coral reefs through MPAs, but that that potential has yet to be realised due to the lack of regional commitment. Such protocols should not, however, be ignored, for they represent some of the best drafting to be found for promoting the conservation of coral reefs through MPAs in multilateral environmental agreements. As such they represent valuable precedents for lawyers and negotiators.

1. INTRODUCTION

Biological diversity, commonly shortened to biodiversity, is the term used to describe the prolific variety of life on Earth in all its forms and at all levels.¹ Three main groupings of diversity can be identified, namely organismal, genetic and ecological. The first relates to the various levels in the taxonomic hierarchy, genetic to the diversity between the components in genetic coding (chromosomes, genes etc) and the last to ecological differences between, for example, habitats, biomes and niches.² More detailed examples of each serve to further illustrate the concept.

Organismal diversity is a familiar part of diversity amongst species. By way of illustration, seven species of sea turtle exist, such as the Hawksbill and Green Turtle. The sheer scale of species diversity, however, is difficult to quantify. Scientists have identified 1.75 million species although they suspect that the number of species actually inhabiting the earth may be closer to 13 million.³

A single species can demonstrate great genetic diversity, which may only manifest itself to human eyes in physical attributes. An example of recent research helps to understand genetic diversity. In a test tube containing a nutrient rich broth, geneticists Paul Rainey and Michael Travisano of Oxford University, demonstrated that within seven days a single species of bacteria, *Pseudomonas fluorescens*, can morph into

¹ For example, between habitats or between biological taxa. K. J. Gaston and J. I. Spicer, *Biodiversity: An Introduction* (Blackwell) (2004) at 4.

² *Ibid* at 5.

³ Secretariat of the Convention on Biological Diversity, *Sustaining Life on Earth* (CBD/UNEP) (2000) at 2.

three distinct forms which were described as smooth, wrinkly-spreader and fuzzy spreader.⁴ This diversity was linked to the varied environmental conditions within the test tube - oxygen levels and physical conditions throughout the tube were not constant.

The variety of environments within which diversification occurs must also, therefore, be included within the concept of biological diversity. Hence as the third group, it is necessary to appreciate that biodiversity also refers to the many different ecological environments that make up the earth as well as appreciating the significance of this diversity in maintaining genetic and organismal diversity. As the test tube demonstrates:

It's the variety of environments – the surface of the broth, the vial's edge, and the bottom – that maintains the diversity. And that's true for the biodiversity of the natural world as well.⁵

Whilst the expansion of life on earth to fill the various niches that became available has continued over the last 4.5 billion years, it is thought that speciation and extinction rates are in equilibrium, meaning that the quantity of biodiversity may not, for the time being, increase beyond current levels.⁶ In this sense, biodiversity may be regarded as a non-renewable resource.⁷ If elements are destroyed, whether through natural or anthropogenic causes, the results of evolution cannot be reproduced. The

⁴ P. B. Rainey and M. Travisano, "Adaptive radiation in a heterogeneous environment" (1998) 394 *Nature* 69.

⁵ Paul Rainey quoted in V. Morell, "The Variety of Life", (1999) 195(2) *National Geographic* 6 at 23.

⁶ P. Birnie and A. Boyle, *International Law and the Environment* (OUP) (2002, 2nd Ed.) at 545.

⁷ *Ibid.*

problem is, human impacts upon biological diversity are now tipping the scales against further diversification through increased extinction rates.

Pollution and the introduction of alien species by humans have had catastrophic effects upon species and habitats. The impact of land based sources of pollution upon coral reef ecosystems, for example, has already been discussed in earlier chapters. Examples of the harmful effects of invasive alien species can also be found from around the world. In 1974, the first hedgehogs were introduced to South Uist in the Outer Hebrides in Scotland in order to control garden pests – just four animals in total. By 2002 the hedgehog population had grown to 5,000 and had spread across all of the Uist islands. As a result, local populations of sea birds were dwindling as the hedgehogs ate the birds' eggs whilst out foraging.⁸

Further, habitat destruction is a major cause of biodiversity loss. Whether it is the destruction of rain forests or the dynamiting of coral reefs by fishermen, the knock-on effect for species and also for genetic diversity should now be easy to recognise. When Paul Rainey and his colleagues regularly shook the test tubes containing the *Pseudomonas fluorescens*, the destruction of the variety in environments into one homogenous broth significantly reduced the diversity.⁹

It was with these concerns in mind that the Convention on Biological Diversity¹⁰ (the “CBD”) was negotiated and ultimately opened for signature in 1992 at the United Nations Conference on the Environment and Development (“UNCED”).

⁸ J. Watson, “Hedgehog cull to save birds” *Scotland on Sunday* (Edinburgh), 15 December 2002.

⁹ Rainey and Travisano, *supra* n. 4.

¹⁰ 31 *ILM* 818.

2. THE CBD - FROM EARLY BEGINNINGS TO SIGNATURE¹¹

In the late 1980's, threats faced by biological diversity were being tackled by some multilateral environmental agreements ("MEAs"), albeit in a piecemeal fashion via regimes to protect particular species or habitats. Many of these regimes will be considered in this study, such as those dealing with wetlands, natural heritage and migratory animals. Further, since 1973, trade in species had been regulated under the Convention on International Trade in Endangered Species.

Such efforts made useful contributions to the conservation of biodiversity, but taken together did not offer universal coverage and significant lacunae were felt to exist which needed remedying. In 1981, IUCN started work building support for, and drafting, a global conservation treaty for biodiversity. Their draft convention's development was subsequently overtaken by the UNEP negotiations which led to the finalising of the CBD text, although the draft nevertheless acted as a basis for early rounds of inter-governmental meetings.¹²

The text of the CBD, which will be considered in the following section, has been heavily criticised. Blame for this has been apportioned, in some circles, to the rushed nature of the negotiations.¹³ Indeed, the United States issued a declaration at the Final Act in May 1992 criticising the text because certain issues, "*whether because of the*

¹¹ A number of authors have described the negotiation process that led to the final draft of the CBD. Their accounts provide a valuable insight into features of the convention's text and objectives. See for example, F. Burhenne-Guilmin and S. Casey-Lefkowitz, "The Convention on Biological Diversity : A Hard Won Global Achievement" (1992) 3 *YIEL* 43; F. McConnell, *The Biodiversity Convention – A Negotiating History* (Kluwer) (1996); V. Koester, "The Biodiversity Convention Negotiation Process and Some Comments on the Outcome" (1997) 27(3) *EP&L* 175.

¹² Burhenne-Guilmin, *ibid* at 44.

¹³ See Boyle, "The Rio Convention on Biological Diversity" in Bowman and Redgwell (eds) *International Law and the Conservation of Biological Diversity* (Kluwer) (1996) 33 at 35.

haste with which we have completed our work...”, were not fully considered.¹⁴ Indeed there was some pressure to complete the negotiations in time for the Rio Earth Summit in 1991 and states only had eight separate occasions over a four year period to negotiate an agreeable text.¹⁵ This might well be thought of as a short time-frame given the complexities of negotiations for such a far-reaching convention.

Whether timing had negative consequences or not, the final text, and subsequent work under the CBD, can justifiably be criticised in large part because of the impact of the fundamental differences in the negotiating positions adopted by developed and developing states. The negotiations were therefore highly politicised – a feature which persists to this day. It may be useful to further review this before analysing the adopted text.

Whilst biodiversity has a ‘life-support’ function, mainly linked to food resources, which is significant to the entire international community, its value tends to be most clearly perceived in developed nations - whether by pharmaceutical companies with the resources to research and unravel nature’s bounty, or by voters who value natural beauty and who, in the 1980’s, were appalled at the mass destruction of rain forests. However, most of the biodiversity so valued by the developed world lies within the

¹⁴ Declaration of the United States of America, Convention on Biological Diversity Final Act Conference, Nairobi, May 1992. However, the USA may not have agreed a text even if more time had been allowed. Thus, one account of the negotiation process indicates that from an early date the US position seemed to be against the adoption of the CBD text in any event. McConnell (*supra* n. 11), who led the UK delegation, felt that in May 1991 the US was “*determined to wreck the convention*”, (at 47) and that their strategy was to “*drag out negotiations until after [UNCED] in the hope that the convention would then be conveniently forgotten*” (at 54). Given the nature of the demands made by developing countries with respect to IP rights and biotechnology which found their way into the text of the treaty and the unacceptability of this to the US, such an attitude does not seem so incredible.

¹⁵ This is on the basis that the inter-governmental meeting of experts in 1988, established pursuant to UNEP Governing Council Decision 14/26, marks the beginning of the negotiation process.

sovereign territory of developing countries. In these states, the pursuit of development comparable to that already achieved by the developed world often comes ahead of environmental considerations. Consequently, with biodiversity conservation not really featuring on developing countries' agendas, this was a classic example of the richer countries wanting the poorer countries to provide a service.

With such a commanding position, developing countries saw the CBD negotiations as an opportunity to restructure global economic relations in order to further their own development needs.¹⁶ Developing countries therefore required that in return for conservation efforts on their part, there should be a reorganization of intellectual property rights and compensation mechanisms with respect to biological resources "discovered" by foreign bio-prospectors within their territory and subsequently developed into products, that developing countries should have access to these products on favourable terms, that continued use of biodiversity (albeit in a sustainable fashion) should be recognised, and that the developed countries should provide extra funding to assist with meeting conservation obligations.

These may not appear such novel demands at first sight since the earlier international regime for protecting the ozone layer¹⁷ included provisions for technology transfer and funding support. However, in that instance, such provisions were included only as part of the compliance mechanism.¹⁸ In the negotiations for the CBD, developing countries were looking for a convention which dealt with the potential economic benefits of biodiversity in their own right, and which they were currently unable to

¹⁶ Boyle, *supra* n. 13 at 36.

¹⁷ 1985 Vienna Convention for the Protection of the Ozone Layer and the 1987 Montreal Protocol.

¹⁸ Boyle, *supra* n. 13 at 38.

realise on their own due to a lack of resources and expertise. Given that they largely achieved their aims, the CBD represents a new departure for MEAs.

Such demands were particularly incompatible with US policy. Other developed states were, however, willing to negotiate, although balancing the two positions was always going to be difficult especially given external developments in other areas of international environmental law. These ranged from the UN's desire to complete the convention text in time for the forthcoming UNCED, to parties bringing grievances from other multilateral negotiations on climate change into the biodiversity forum. As Koester notes:

many developing countries... felt that the climate change solution had been imposed upon them by the North. They were therefore determined more than ever, to obtain what they in reality desired from the CBD¹⁹

Keeping in mind these highly politicised events as the back-drop to the CBD negotiations, it is now appropriate to turn to the final text of the convention as signed by 153 states at the Rio Earth Summit in 1992.

3. THE CBD'S CONSERVATION PROVISIONS

The text as adopted at the Final Act Conference in 1992 and opened for signature at UNCED represents a compromise between the visions of developed and developing states.²⁰ The result is a convention that departs from purely conservation-based objectives, to covering the sustainable use of biodiversity's components, and the fair

¹⁹ Koester, *supra* n 11 at 179 and see further McConnell *supra* n 11 at 84.

²⁰ Koester describes the final text as representing "*a North/South political compromise and hence the art of the possible*", *supra* n. 11 at 187.

and equitable sharing of the benefits arising from the use of genetic resources, which includes access to genetic resources and technology transfer.²¹

Whilst the importance of linking conservation and sustainable development had been recognised since at least the Brundtland Commission's report of 1987,²² a new departure, as mentioned earlier, was the inclusion in Articles 15-19 of provisions on access to genetic resources, access to and transfer of technology, exchange of information, technical and scientific cooperation and finally the handling of biotechnology and distribution of its benefits. These provisions were effectively the price developed countries were being asked to pay for the cooperation of developing countries in undertaking conservation measures.

These provisions will not be explored in detail in this study as they are not directly relevant to the promotion of marine protected areas ("MPAs") as a conservation strategy for coral reef ecosystems. The exception to this, however, is the section of the convention which can be clearly interpreted as part of the "payment" for conservation in both figurative and literal terms. These are the provisions on finance. Despite being included in the latter parts of the convention, these will be looked at first, as one interpretation suggests that these provisions amount to a condition precedent to the fulfilment of conservation obligations by the most important group of states from a coral reef perspective. This study will then proceed to consider the jurisdictional scope of the CBD, relevant underlying principles and objectives, and finally the conservation obligations themselves.

²¹ CBD Article 1 (Objectives)

²² Report of the World Commission on Environment and Development, *Our Common Future* (1987).

3.1 FINANCES

Implementing new conservation obligations was always going to place a strain upon the resources of developing countries. As Johnston points out, Agenda 21 estimated that the cost of implementing conservation measures for biodiversity would be about US\$3.5 billion p.a. and of that US\$1.75 billion would need to come from the international community by way of gifts or loans on concessional terms.²³ Some form of mechanism for ensuring a flow of finances to developing countries in support of their efforts to meet conservation objectives was therefore required. Articles 20, 21 and 39 look to satisfy this demand and the manner in which they do so is of particular significance from a number of perspectives.

First, Article 20(2) states that developed country parties²⁴ are obliged to provide new and additional financial resources, i.e. in addition to existing development assistance from other funding sources. This dedicated pool of money is to be made available to developing countries for meeting the “*full and incremental costs... of implementing measures which fulfil*” their obligations under the CBD, including conservation and administrative requirements.²⁵ The quantum of these full and incremental costs is to be agreed between a developing country and the designated body operating the financial mechanism agreed upon at a Conference of the Parties (“COP”).²⁶

²³ S. Johnston, “Financial Aid, Biodiversity and International Law” in Bowman and Redgwell (eds), *supra* n. 13, 271 at 271.

²⁴ A list of developed countries, and countries willing to assume the responsibilities of developed countries, was, in accordance with Article 20(2), adopted at COP-1 (decision I/2, annex II). These countries are Australia, Luxembourg, Austria, Monaco, Canada, Netherlands, Denmark, New Zealand, Finland, Norway, France, Germany, Spain, Greece, Sweden, Iceland, Switzerland, Italy, United Kingdom, and Japan.

²⁵ Article 20(2).

²⁶ *Ibid.*

Article 21 states that the finances provided will be managed by an institution under the ultimate authority of the COP to the CBD. Whilst originally appointed only up until the first COP in 1994,²⁷ the Global Environment Facility (“GEF”) remains the chosen institution responsible for operating the mechanism. It is, however, for the COP to determine the policies, priorities, criteria and guidelines for ultimate allocations of resources, which should include monitoring subsequent use of funds.²⁸

Finally, Article 20(4), which is of particular importance, says:

The extent to which developing country Parties will effectively implement their commitments under the Convention will depend on the effective implementation by developed country Parties of their commitments under the Convention related to financial resources and transfer of technology...

The interpretation of this article is, however, problematic.

3.1.1 *Interpreting Article 20(4)*

One widely held view is that this provision establishes a pre-condition to developing countries having to perform the obligations imposed upon them under the convention. Thus, De Klemm and Shine state that a failure by developed countries to provide financial and technological resources means that:

developing countries are considered by the Convention as no longer bound by their conservation obligations.²⁹

²⁷ Article 39.

²⁸ Article 21(2).

²⁹ C. de Klemm and C. Shine, *Biological Diversity Conservation and the Law* (IUCN) (1993) at 23. See for similar interpretations Johnston, *supra* n. 23 at 271 and R. Wolfrum, “The Convention on Biological Diversity: Using State Jurisdiction as a Means of Ensuring Compliance” in R. Wolfrum

If this is correct, obvious concerns arise from the perspective of this study in judging the approach of the CBD to promote the conservation of coral reefs through MPAs, given that the majority of coral reefs lie within the jurisdiction of developing countries.

However, such arguments are not without their opponents. Chandler, who acted as one of the US legal advisors during the CBD negotiations, suggests that Article 20(4) is simply a statement of factual reality.³⁰ She notes that, at the start of the final negotiating session, wording supporting a pre-condition approach to financial and technological provision was proposed as a clause following the conservation obligations, but that this was specifically rejected.³¹

Problems arise with both views. The pre-condition interpretation has, as was just noted, been attacked on the basis that such a mechanism was specifically rejected during the final negotiations. However, even if such supplementary means of interpretation could validly be called upon, the peculiar arrangements surrounding the final negotiations of the text undermine the usefulness of draft texts. As McConnell describes, during the final hours of negotiations, many of the sticking points in the draft treaty were informally thrashed out in the office of UNEP's Executive Director amongst a small group of key states. McConnell, who was present during the final meeting in the Executive Director's office, records that:

(ed), *Enforcing Environmental Standards: Economic Mechanisms as Viable Means?* (Springer) (1996) 373 at 389.

³⁰ M. Chandler, "The Biodiversity Convention: Some Selected Issues of Interest to the International Lawyer" (1993) 4 *Col. JIEL&P* 141 at 173-4.

³¹ *Ibid.*

To balance the acceptance in [Article 20(1)] that all countries were subject to some financial obligations, the G77 members exacted a counter clause which implied that the developing countries would only be expected to implement the convention if they received the necessary finance and technology³²

Two opposing points of view seem to exist, therefore, as to whether the pre-condition was or was not rejected during the final negotiating session, highlighting the difficulty in relying upon such sources for interpreting the CBD.

However, the pre-condition interpretation does, in the author's opinion, suffer from one central problem. Put simply, an ordinary reading of the CBD's structure and text does not easily fit with such an interpretation. For example, the conservation obligations do not begin with wording this thesis might expect to see if the intention was to make such obligations conditional upon prior provision of financial and technological resources i.e. something akin to "*the obligations of developed and, subject to Article 20(4), developing, contracting parties shall be...*". This would have been easy to achieve, and was, according to Chandler, duly proposed in the draft treaty text.³³ Further, Article 20(4) only suggests that the *extent* (i.e. degree) of compliance, not the *duty* of compliance, turns upon financial and technological support from developed countries. Therefore, to say that developing countries are no longer bound by conservation obligations if developed parties do not transfer money

³² McConnell, *supra* n. 11 at 94.

³³ Chandler, *supra* n. 30 at 173, fn 100 setting out the proposed text as "*For Contracting Parties which are developing countries the obligations under Articles 5, 7, and 8 of this Convention would be subject to the provision to them of technical resources, as appropriate, and of adequate, new and additional financial resources...*"

and technology to them requires wording which simply does not exist in Article 20(4).

Conversely, Chandler's viewpoint, that one is simply dealing with a statement of practical reality if funding and other support is not forthcoming, seems odd. Article 20(4) was negotiated for inclusion in the substantive legal sections of the treaty, rather than the preamble, and as such must be interpreted so as to have some form of legal meaning.³⁴

It is therefore difficult to determine the matter conclusively either way³⁵ although the author's preferred interpretation does not lie with that of the article being a precondition. This stance is also based upon an alternative interpretation which would still give a legal meaning to Article 20(4). The article could simply be seen more as a reflection of the principle of international environmental law that states have common but differentiated responsibilities.

Under this principle, all states are believed to share common obligations to protect or conserve a particular part of the environment. In the case of the CBD, as will be seen in the following section, this would be because of a perceived common concern of mankind in biodiversity. However, international environmental law regards certain problems as not having been generated equally by all states, nor as being possible to resolve equally by all states due to differing abilities to reduce or control a given

³⁴ *Cayuga Indians Claims* (1926) 20 *A.J.* at 587 quoted in McNair, *The Law of Treaties* (Clarendon Press) (1961) at 285: "Nothing is better settled, as a canon of interpretation in all systems of law, than that a clause must be so interpreted as to give it a meaning rather than so as to deprive it of meaning."

³⁵ Most commentators prefer to note both perspectives. See Burhenne-Guilmin and Casey-Lefkowski, *supra* n. 11 at 56; A. Boyle, *supra* n. 13 at 44-5; L. Glowka *et al*, *A Guide to the Convention on Biological Diversity* (IUCN) (1994) at 104.

threat to the environment. This latter consideration may manifest itself in MEAs in the form of delayed or less stringent commitments for particular states.³⁶

As Boyle notes,³⁷ the principle of common but differentiated responsibilities permeates the CBD through the use of qualifiers to obligations such as “*as far as possible and appropriate*”. Article 20(4) could therefore be interpreted as an extension of this principle and as a mechanism for determining its operation. Thus the starting position is one where all parties are unconditionally subject to the conservation obligations although only to a standard set in accordance with differentiated responsibility principles. Article 20(4) then provides a mechanism whereby levels of responsibility, and therefore expectation, may be adjusted through the provision of financial and technological support by developed states.

Clearly, it is difficult to decide upon a definitive interpretation of Article 20(4) and in practice developing states are seeking to meet their conservation commitments. This may be a reflection of an unwillingness to rely upon Article 20(4) as a basis for inactivity where legal advisors are uncertain as to the likelihood of a sympathetic interpretation in any non-compliance dispute proceedings. It may of course reflect the fact that developed countries are providing financial and technological support. It is to this important question which this study must now turn, for, whatever the possible legal implications of lack of financial and technological support, the practical impacts upon the effectiveness of any programmes for conserving coral reef ecosystems within marine protected areas under the CBD, will remain.

³⁶ P. Sands, *Principles of International Environmental Law* (CUP) (2003, 2nd Ed.) at 289.

³⁷ A. Boyle, *supra* n. 13 at 44-5.

3.1.2 *The Provision of Financial and Technological Support*

Tentative conclusions can be drawn with respect to the need to provide new and additional finances. Concerns about failings in this field were raised by Birdlife International in 1996³⁸ and then picked up by some commentators in developing countries a few years later.³⁹ Despite difficulties in collecting data owing to inadequate reporting requirements on financial commitments, Birdlife International's conclusions caused concern. Their report found that not only were current pledges and donations to the GEF well below the annual figure needed to meet conservation demands, but that such contributions were not new and additional, being less than that which had been provided before the CBD was agreed. They therefore called for more transparency on meeting financial commitments by developed countries through a change in reporting obligations, an overall increase in funding levels and consideration of alternative methods for providing financial support to developing countries, such as restructuring debt obligations.

Bearing these criticisms in mind, developments since the Birdlife International report are such that, whilst GEF contributions did not initially increase for the 2nd GEF replenishment, pledges for the 3rd GEF indicate an increase with almost \$1.675 billion currently promised for the period 2002-2006.⁴⁰ Whilst this amount appears from the GEF financial statement to be an increase from the years before the CBD, the annual amount available falls short of the earlier mentioned estimated annual costs of

³⁸ Birdlife International, *New and Additional? Financial Resources for Biodiversity Conservation in Developing Countries 1987-1994* (1996).

³⁹ A. H. Ansari and P. Jamal, "The Convention on Biological Diversity: A Critical Appraisal with Special Reference to Malaysia" (2000) 40 *Indian Journal of International Law* 137 at 174.

⁴⁰ *Contributions to GEF as of June 30, 2003* available at www.gefweb.com.

conservation calculated by Johnston. It is this shortfall which is now the focus of concern for conservationists.

In the lead up to COP-7 of the CBD which was due to be held in 2004, the Royal Society for the Protection of Birds ("RSPB") called for a mechanism to be put in place to ensure funding pledges were kept, and that specific commitments to provide adequate levels of financing should be made to implement convention initiatives, which in this instance referred specifically to the plan to establish a network of protected areas which was projected to cost £14.5 billion per annum.⁴¹ Less than two weeks later, the RSPB's frustrations at the failure of contracting parties to make any commitments to finance a protected areas plan were evident in a follow up statement:

As expected, governments are in total denial about money. In this respect, we can see the hidden dark hand of the developed world's treasuries at work. So disinterested are they that finance officials have not even bothered to turn up [to COP-7]. Yet they remain content to sabotage the future of global biodiversity, ensuring the money needed for protected areas is still not available.⁴²

Whether or not deliberate attempts to sabotage progress in conserving biodiversity are really being made by government treasuries, it is clear that biodiversity initiatives (such as a protected areas network) are expensive exercises and therefore suitable mechanisms and commitments with regards to money and provision are required.

⁴¹ RSPB Public Relations Department Press Release, *Rich states must pay up to protect rare wildlife*, February 9, 2004.

⁴² Alistair Gammel quoted in RSPB Public Relations Department Press Release, *Rich nations' delay increases danger to rare species*, February 20, 2004.

3.1.3 Summary

As developing countries pointed out right from the start, the reality is that their ability to meet conservation obligations turns upon such finances, capacity building and, as mentioned earlier, also the transfer of technologies. In the politicised cauldron of CBD proceedings, shortcomings in these areas also provide motivation for obstructiveness in other areas of CBD work. Articles 20, 21 and 39 are therefore key to the successful implementation of the CBD and its programmes of work. In this way, any initiatives under the CBD to promote the conservation of coral reef ecosystems through designating MPAs similarly depend upon the same provisions. Whilst the author does not believe they amount to a condition precedent to the imposition of obligations upon developing states, the importance of these articles is clear. Current concerns about inadequate support therefore demand serious consideration and resolution.

3.2 JURISDICTION AND COVERAGE OF THE CBD

The CBD defines biological diversity as:

the variability among living resources 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 ecosystems⁴³

A number of points can therefore be made with a bearing upon the coverage or scope of the CBD. First, recalling the opening of this chapter, the definition used by the contracting parties reflects the various levels in which biological diversity occurs.⁴⁴

⁴³ Article 2.

⁴⁴ The reference to diversity within species indicates that genetic diversity is also included.

Second, the definition tackles the concerns over lacunae in international environmental legal protection by being wide enough to include all habitat types and species of flora and fauna. Third, and following on from the second point, biological diversity is drafted in such a way so as to include corals, coral reefs and coral reef ecosystems. This latter point is not without significance given the question marks which exist over the definitional clauses under other MEAs looked at in this study and their ability to include coral reef ecosystems within their remit.⁴⁵

Such an all-embracing remit, unfortunately, also brings difficulties. The concept of biodiversity, which has been so faithfully incorporated within the CBD framework, covers all forms and aggregations of life on earth, from the rare Spix's Macaw, to the Common Starling, and from the prairies of Mid-West America, to prairie planting schemes in domestic back gardens. In contrast to relatively focused conventions infused with urgency in order to protect particular threatened species or habitats, the CBD is faced with such wide responsibilities that it could be forgiven for not being able to tell the wood from the trees when trying to decide what it should be doing. If one adds in the fact that the CBD is not just about conserving biodiversity, but also using it sustainably, controlling alien species, establishing a framework for intellectual property rights in biodiversity and taking steps to regulate the use of genetically modified organisms, its agenda runs the risk of becoming unmanageable without rigorous priority setting. As Wold believes, this had led to unfortunate consequences:

⁴⁵ See Chapter 8.

this sweeping agenda is far too ambitious... The Parties have opted for an annual 'issue', but the perpetually crowded agenda at Conferences of the Parties makes the previous year's issue 'last year's model'.⁴⁶

Thus, Wold suggests, particular issues are developed at a COP, but receive little attention thereafter as the CBD identifies its next pet subject. Whether this is an entirely accurate description is open to question, for as will be seen in the later discussion on marine and coastal biodiversity under the CBD, work often continues in working groups outside of this central CBD forum.

However, it is possible to detect "pet" issues at COPs, a phenomenon which does seem to be the result of the CBD needing to spend time finding its feet in terms of establishing its mission statement, policies and programmes for given issues within its mandate. Given the burden of the wide scope of the convention referred to, this has taken precious time. The next important step is consequently to turn the focus from policy formulation to implementation.

That same wide scope also means that the CBD's mandate often strays into areas already covered by other MEAs. This has consequences as to which treaty takes priority in law (a subject which will be looked at later) whilst in more practical terms this also raises the spectre of duplication of efforts and inter-regime competition for responsibility. The natural conclusion seems to be that, with the CBD already faced with such a vast range of issues, it would pay to integrate and, as far as possible, delegate responsibility to these existing regimes. This would not only help in managing the work load noted in Wold's study, but also reduce likely conflicts and duplication with other MEAs.

⁴⁶ C. Wold, "The Futility, Utility and Future of the Biodiversity Convention" (1998) 9 *Col. JIEL&P* 1 at 12.

Turning away from the definition of biological diversity, the CBD goes on to clarify its geographical jurisdiction. As Chandler identifies, such jurisdictional clauses are often determined in accordance with particular habitats, species listed in a schedule, or designated areas.⁴⁷ The CBD adopts a more general approach through reference to biological components and processes and activities. Article 4 applies the provisions of the convention to components of biological diversity within the boundaries of a state's jurisdiction. As noted earlier in this study, the 1982 Law of the Sea Convention establishes that states have jurisdiction over living resources up to 200 nautical miles from their coastlines. The CBD therefore applies to corals and coral reef ecosystems, as components of biodiversity, in a state's Territorial Waters and Exclusive Economic Zone.⁴⁸ Further, processes and activities carried out under a state's jurisdiction or control, are also caught by the CBD's jurisdiction whether carried on within national boundaries or beyond such limits.

The final element with regards to jurisdiction and remit is the geographical coverage of the CBD in real terms judged by the number of contracting parties. More particularly from the point of view of this study, it must also be asked how many states are parties to the convention in which coral reef ecosystems are found.

The CBD is noteworthy for the number of parties who have become contracting parties. 153 states signed the treaty at the Rio Earth Summit in June 1992 and the vast majority proceeded to ratify the convention. As is evident from Appendix I to this

⁴⁷ Chandler, *supra* n. 30 at 147.

⁴⁸ As Chandler also notes, components of biodiversity found in the high seas, i.e. outside of a state's jurisdiction, are only included through Article 5 where contracting parties must co-operate in the conservation and sustainable use of biodiversity. *Ibid* at 147-148.

study, this positive state of affairs is reflected in the number of coral reef host states who are parties to the convention.

Based upon UNEP's 2002 study of coral reef distribution which indicates the number of states in which reefs are found and the approximate figures for area of reef found in a country, it can be seen that all but three coral reef states are parties to the CBD – the USA, Brunei and Somalia have yet to ratify the convention. This total represents 98.35% of global coral reefs and therefore places the CBD in the strongest position for potentially influencing coral reef conservation and MPA initiatives, in comparison with the other MEAs which have been or will be considered in this study. Of course, bringing the USA within the regime would offer a significant increase in coverage (an extra 1.3%) but this may not be a realistic possibility in the light of the USA's position with regards to the convention and its provisions on biotechnology, IP rights and access to technology. In any event, the USA still takes something of an active role with regard to biological diversity as it follows developments under the CBD and often attends COPs. Indeed, as Davidson notes:

Even though the United States has not ratified the CBD, some members of Congress are applying its principles to preserve coral reefs.⁴⁹

In summary, it can be seen that the CBD is drafted in such a way so as to include corals, coral reefs and coral reef ecosystems, and that the geographical coverage over these habitats is particularly favourable. Of course, the wide scope and number of parties throws up particular problems, namely establishing and running such a wide agenda, managing external relations with other MEAs and garnering consensus among so many contracting parties in what has historically been a highly politicised

⁴⁹ M. G. Davidson, "Protecting Coral Reefs: The Principal National and International Legal Instruments" (2002) 26 *Harv. ELR* 499 at 534.

negotiating environment. To that extent, the CBD is in danger of becoming a victim of its own success regarding the level of membership it has achieved and responsibilities it acquired.

3.3 PRINCIPLES, OBJECTIVES AND CONSERVATION OBLIGATIONS

3.3.1 *Principles and Objectives*

The opening part of the treaty establishes the CBD's principles, objectives and obligations, the majority of which are relevant in some way to the promotion of MPAs and the conservation of coral reef ecosystems.

The preamble to the CBD justifies international measures on the basis that biodiversity is "*a common concern of mankind*". This idea was discussed in detail in Chapter 5 and the CBD serves as a clear illustration of the significance of common concern as a justification for the international community's involvement when natural resources amount in the main to sovereign property and where in most cases cross-border problems may not be an issue.

Such justification, as was mentioned, does not alter the fact that biodiversity remains a sovereign resource of contracting parties, and this is reinforced as a dominant theme running through the convention's text. As has already been pointed out, this was a particular concern for developing countries. Thus, the preamble follows the statement of common concern with a reassertion of the fact that states have sovereign rights over their own resources. This is then carried through into the operative parts of the convention in Article 3 - "*States have... the sovereign right to exploit their own*

resources pursuant to their own environmental policies” - and in Article 15 which provides that each state has the authority to control access to genetic resources.⁵⁰

Moving on to the CBD’s objectives, Article 1 sets these out as the conservation of biodiversity, the sustainable use of its components, and the fair and equitable sharing of the benefits arising from the use of genetic resources which includes access to genetic resources and technology transfer.⁵¹ With the conservation objective so generally defined, the text of the CBD then proceeds to provide greater detail as to what obligations the contracting parties are under in order to achieve this goal

3.3.2 Conservation Obligations – General Observations

Article 6 expands upon Article 1, by establishing the “*General Measures for Conservation and Sustainable Use*”. Under this article, contracting states must “*in accordance with [their] particular conditions and capabilities*” produce new, or adapt existing, strategies, plans or programmes for conserving biodiversity and using it in a sustainable manner. The conservation of biodiversity and its sustainable use should likewise be integrated in relevant sectoral plans, policies and programmes.

Article 6, therefore creates an obligation capable of being monitored by the international community, i.e. the production or adaptation of these policies, strategies

⁵⁰ Article 15(1).

⁵¹ P. Le Prestre, “The CBD at Ten: The Long Road to Effectiveness” (2002) 5 *JIWLP* 269 at 270. What seems an innocuous declaration of intent has, so it is claimed, had an impact upon the development of the CBD regime. As was noted earlier, during the negotiation process different states had different priorities with respect to what they wanted to achieve, which is neatly crystallised in Article 1. These different priorities continue to emerge at meetings and in particular, so Le Prestre claims, in the degree of linkage states accord the three objectives in Article 1. In essence this involves developing countries viewing the objectives as being inseparably linked, whilst other parties want to un-link them so that activities can be completed without worrying if one objective is more advanced than another.

or programmes, which are commonly referred to as National Biodiversity Strategies and Action Plans. The same can be said for Article 7; another provision giving greater detail on the conservation provisions under the CBD. Under that article, contracting parties must, so far as possible and as appropriate:

- (a) Identify components of biodiversity important for its conservation and sustainable use;
- (b) Monitor the components identified in (a), in particular those requiring urgent conservation or identified as offering the greatest potential for sustainable use; and
- (c) likewise identify processes and activities which have or are likely to have a significant impact upon the conservation and sustainable use of biodiversity, and monitor their effects.

Parties are expected to maintain and organise such data, although the form this should take is left to their discretion. Further, in identifying components of biodiversity under (a), parties are guided by CBD Annex I which suggests, *inter alia*, that particular regard should be had to ecosystems and habitats which contain high diversity, large numbers of endangered or endemic⁵² species, or which are of economic value. Annex I further provides that at the species level, particular regard should again be had to, *inter alia*, threatened or economically valuable species or communities.

If parties do identify processes and activities under (c) above, then they are obliged to regulate and manage such activities, presumably in accordance with the general objectives of the CBD, as provided for in Article 8(l).

⁵² Endemic species are those which are only found in a particular place or region.

There then follow the most detailed articles on conservation and sustainable use, in the majority of cases predicated to be on the basis that the state's obligation to fulfil the requirements is to be only "*as far as possible and as appropriate*". The provisions range from ex-situ conservation measures such as captive breeding programmes,⁵³ to research and training,⁵⁴ public education programmes,⁵⁵ community involvement in conservation initiatives⁵⁶ and environmental impact assessments for projects likely to have a significant adverse effect upon biodiversity.⁵⁷ More particularly, and of relevance to this study, is Article 8 on in-situ conservation measures which includes establishing a system of protected areas. These particular provisions will be discussed in greater detail later in this chapter.

One important point arising from the aforementioned articles relates to the focus upon mechanisms at state level for conserving biodiversity and its sustainable use. This, as was noted earlier, was the preferred foundation for the convention during the negotiation phase. Thus for example, an emphasis can be detected upon national policies and programmes and national biological surveys but a lack of provision for international initiatives – e.g. obligations centred around international lists of priority habitats and species, or international registers of protected areas. This is not to say that attempts were not made, nor that pressure will not be brought to bear subsequently, for such mechanisms to be included. This can be demonstrated with

⁵³ Article 9.

⁵⁴ Article 12.

⁵⁵ Article 13.

⁵⁶ Article 8(j).

⁵⁷ Article 14.

regard to the wrangling over the incorporation of lists into the convention during the negotiations.

Throughout these talks, developing countries were keen to reassert their sovereignty over natural resources. They were therefore eager to keep the rest of the international community at arms length from management of their natural resources. This attitude seems, in turn, to have been *ad idem* with some developed countries approaches to conserving biodiversity which laid emphasis upon national implementation alone – i.e. unilateral rather than international action was the preferred approach.⁵⁸ Unlike other MEAs considered in this study, this meant rejecting as incompatible with national strategies and implementation, any attempt to establish a system of global lists of either protected areas or priority species and ecosystems; a strategy favoured particularly by France. This position was maintained by developing countries throughout the final round of negotiations, and, as McConnell describes, whilst France allowed the issue to be put on the back burner in order to proceed with other matters, the subsequent failure to re-open the topic by the chairmen led to “*entirely undiplomatic exchanges*”.⁵⁹ France ultimately made a forthright declaration at the Final Act Conference:

France expected practical and sound provisions to strengthen the conservation of biodiversity. Such provisions are few and too vague. In this respect, it seemed to stand to reason to include a provision existing in several conventions... in a convention on biological diversity: we refer to global lists. France regrets that the manner in which the text of the

⁵⁸ McConnell, *supra* n 11 at 60 and 89.

⁵⁹ *Ibid* at 84.

convention was adopted did not allow it to make a compromise proposal on the question of the global approach to biological diversity.⁶⁰

As seems clear, the decision to omit lists was based upon the central role given to national implementation in meeting the CBD objectives, which in turn came from the assertion of national sovereignty over resources. Of course, the future inclusion of lists under the regime is not ruled out in the text and remains a possibility. For example, some form of list could be introduced through a subsequent protocol. However, in reaching a balanced view on the merits of the current and any possible future approach, a number of arguments could be advanced against the incorporation of lists. For example, it is at the national level that the real work for conserving biodiversity will be undertaken and policies are arguably more likely to be implemented and accepted if formulated nationally – and preferably at community level.⁶¹

Further, formulating classifications upon which to base lists of “internationally significant” or “most at risk” habitats and species is not an easy task. Whilst not an impossibility, it should be noted that the Ramsar Convention spent some time and effort developing a sufficiently detailed classification list of just one category of habitat types, namely wetlands.⁶²

There is, however, much to be said for global lists, particularly from an MPA point of view where it is worth recalling that conservationists are concerned that there are not

⁶⁰ Declaration of France, Convention on Biological Diversity Final Act Conference, Nairobi, May 1992

⁶¹ See Burhenne-Guilmin and Casey-Lefkowski, *supra* n. 11 at 52.

⁶² See further Chapter 8.

enough MPAs being designated and that those that have been created are no more than “paper parks” in practice.⁶³

Although states may have wanted to keep the international community at arms length over conservation measures, as Burhenne-Guilmin recognises, the rejection of international standard-setting and demands could result in the adoption of differing approaches, priorities and goals. This is the very position that existed before the convention and it was hoped could be improved.⁶⁴ Ultimately, as Stone believes,⁶⁵ priorities may well be set by an inter-governmental financing body - currently the GEF – as policies and priorities have to be developed for the channelling of limited resources. Agenda setting at the international, rather than national, level may therefore be inevitable.

International environmental lawyers are also acutely aware of the need to look at improving compliance and enforcement with MEAs. Listing mechanisms are a clear means for monitoring progress in meeting objectives and a mechanism for gently coercing states into action. They also offer international recognition and status which can be exploited for commercial benefit.

The absence of lists therefore involves forgoing a key tool which can be deployed by MEAs to stimulate action on the part of contracting parties, for strengthening obligations, for bringing about a degree of consistency and to allow monitoring of implementation. The failure to include a listing mechanism in the CBD seems to

⁶³ See further Chapter 4 and M.D. Spalding *et. al.*, *World Atlas of Coral Reefs* (University of California) (2001) at 70.

⁶⁴ Burhenne-Guilmin and Casey-Lefkowski, *supra* n. 11 at 52.

⁶⁵ C. D. Stone, “Stemming the Loss of Biological Diversity: The Institutional and Ethical Contours” (1997) 6(3) *RECIEL* 231 at 235.

reflect more the negotiating position of developing countries, for whom sovereignty over resources and freedom to develop land without exposure to international pressure, outweighed their concerns for conservation. The failure to consider the benefits of listing as a means of achieving the CBD's objectives, seems to have been a major deficiency in the negotiations.

3.4 FRAMEWORK OR UMBRELLA AND RELATIONS TO OTHER MEAS

Before the CBD entered into force, a number of MEAs already existed which sought to conserve habitats or particular species. Further, the environmental jurisdiction of the CBD, in the light of the definition on biodiversity, results in a large overlap between the convention and those pre-existing treaties. This throws up important questions about the relationship between these conventions and which takes precedence in situations where, as is likely to be the case, a state finds itself a party to two conventions seeking to conserve the same habitat or species. Unfortunately from the point of view of MPAs and coral reef ecosystems, resolving such issues based upon purely legal arguments is not very easy, and practical solutions must therefore be found.

The early development of the CBD is the starting point for addressing this problem. The CBD process began in 1987 when the 14th Governing Council meeting of UNEP issued Decision 14/26 establishing an ad hoc expert group to investigate the possibility, and desire, for an umbrella convention rationalising activities within the field of biodiversity conservation. As Chandler notes,⁶⁶ this decision was initiated by the US given their frustration at the existing sectoral approach of conventions like the

⁶⁶ Chandler, *supra* n 47 at 141-2 and see further McConnel, *supra* n 11 at 5.

Ramsar Convention on Wetlands, the World Heritage Convention and the Convention on Migratory Species.

Whilst this may have been the initial motivation for the CBD, as is clear from the commentaries on the negotiation process⁶⁷ the idea of rationalizing existing MEAs under a single umbrella convention on biodiversity was rejected as too difficult. Thus, pre-existing MEAs were to remain in force. Instead, the CBD was to be a form of framework convention, whereby contracting parties would be left to develop the means by which obligations would be implemented at the national level, and a mechanism would be provided for the development of protocols.⁶⁸ As to the latter, Article 28 envisages their adoption through the COP, which has led to one such instance so far, namely the Cartagena Protocol on Biosafety.⁶⁹

The decision to leave pre-existing MEAs to run alongside the CBD resulted in the problem this study is now seeking to address, namely determining the relationship between conventions which may seek to govern the same matters. This therefore generates questions about successive conventions under the law of treaties.

In order to illustrate the problem and the application of the rules, the following scenario will be imagined. Kenya and the UK are contracting parties to both the CBD and the Ramsar Convention on Wetlands, whilst the USA is only a contracting party to the latter. As has been noted and shall be seen, coral reefs fall within the ambit of these MEAs and both seek to provide for their conservation. In a (fictitious) dispute between the UK and Kenya, and between the USA and Kenya over the African state's failure to conserve coral reefs, which convention takes precedence?

⁶⁷ *Supra* n 11, and in particular Koester, *supra* n 11 at 177.

⁶⁸ See further on this dual sense of framework L. Glowka *et al.*, *supra* n. 35 at 1-2.

⁶⁹ 39 *ILM* (2000) 1027.

Redgwell suggests⁷⁰ that such an analysis could begin with Article 30(3) of the 1969 Vienna Convention on the Law of Treaties,⁷¹ which provides that where the states are parties to both treaties, the earlier treaty applies only as far as provisions are compatible with the latter's. Where one state is a party to both, and the other state party to only one, it is the treaty to which both are contracting parties which will govern the dispute.⁷² Reverting to the example, on this basis Ramsar will certainly govern the dispute between the US and Kenya. As between the UK and Kenya, however, a possible incompatibility may arise between the conservation obligations of the two conventions. This might arise, for example, if Article 20(4) of the CBD is to be interpreted as making Kenya's conservation obligations conditional upon financial and technological support under the CBD's financial provisions. If so, then the CBD would govern the dispute between the UK and Kenya in the example.

The Vienna Convention provisions can, however, be replaced by specific provisions within a treaty determining relations with other agreements.⁷³ Article 22 of the CBD displaces the Vienna Convention provisions by stating in the first sub-paragraph that the CBD:

shall not affect the rights and obligations of any Contracting Party deriving from any existing international agreement except where the

⁷⁰ C. Redgwell, "The Protection of the Antarctic Environment and the Ecosystem Approach" in Bowman and Redgwell (eds), *International Law and the Conservation of Biological Diversity* (Kluwer) (1996) 109 at 127.

⁷¹ 8 *ILM* (1969), 679

⁷² Article 30(4), *ibid.*

⁷³ Refer to A. Aust, *Modern Treaty Law and Practice* (CUP) (2000) at 174-181 for the various forms of succession clauses that may be employed.

exercise of those rights and obligations would cause serious damage or threat to biological diversity.

What is the impact of this upon the working example. Kenya will be expected to meet both its obligations under the CBD and the pre-existing Ramsar Convention, except in the case of the latter where meeting its requirements would cause serious damage or threat to biodiversity. In this particular instance, such a conflict is extremely unlikely to arise given the potential benefits to biodiversity of Ramsar's obligations – as indeed will also be the case for those MEAs studied in this thesis.

However, Article 22(1) does reverse one outcome which would otherwise have followed from the application of Article 30(3) of the Vienna Convention. It now seems possible for the UK, by reference to the Ramsar Convention, to defeat any possible arguments by Kenya that its conservation obligations towards coral reef ecosystems have been displaced on account of non-provision of financial or technological support under the CBD. This is because any incompatibility between the two treaties is to be resolved in favour of Ramsar, the provisions of which, far from causing or threatening harm to biodiversity, actually provide a stronger guarantee of protection than the CBD itself.

Thus, many conservation treaties will remain in effect, and developing countries may be precluded from relying upon any possible arguments that the CBD's financial provisions relieve them of their conservation obligations. This is not the end of the matter, however, for Article 22(2) to the CBD provides that:

Contracting parties shall implement this convention with respect to the marine environment consistently with the rights and obligations of States under the law of the sea.

This is of importance given that this study is concerned with the international law of MPAs and the conservation of coral reef ecosystems.

The CBD specifically envisages action within the marine environment, and, as will be seen later on, promotes conservation by, *inter alia*, the setting up of MPAs. The difficulty with such obligations are that they, again, encroach into an area governed by rules on jurisdiction, sustainable use of resources and conservation expounded in existing treaties. However, unlike the other treaties which have been considered so far in this section, some rules of the sea demand a degree of primacy, such as customary rules on freedom of navigation. Article 22(2) therefore requires consistency of implementation with the law of the sea, thereby effectively subordinating CBD rules where incompatibility exists.

The problem which arises is actually identifying the body of rules which constitute the law of the sea. Certain treaties or customary rules will automatically come to mind such as the 1982 Law of the Sea Convention, but it strikes the author that it is a bold step to assert that the term is limited to these conventions.⁷⁴ What of other treaties which have formulated rules and obligations for the marine environment such as the regional seas programmes, the Antarctic treaties and those which will be encountered later on in this study which have jurisdiction over marine habitats? If these are included, then arguably the CBD will be subordinated irrespective of inconsistencies which might harm or cause damage to biodiversity.⁷⁵

⁷⁴ For such an assertion see R. Lagoni, "Marine Protected Areas in the Exclusive Economic Zone" in A. Kirchner (ed.), *International Maritime Environmental Law – Institutions, Implementation and Innovations* (Kluwer) (2003) 157 at 166.

⁷⁵ See further Redgwell, *supra* n. 70 at 128.

Thankfully this confusion should have little practical effect given the general compatibility of the treaties which will be considered with the conservation objectives of the CBD. Further, disputes between states, such as those used in the illustrative example, rarely develop in environmental law to a point where lawyers are called upon to interpret succession provisions. Instead, such overlaps as arise under the CBD with pre-existing MEAs are far more likely to be of practical concern to contracting parties in situations where limited resources are expended on matters which are seemingly duplicated under existing conventions. Christopher Stone recognises this inevitable problem but believes that the CBD should avoid duplicating efforts where existing MEAs are already taking action which furthers the CBD's aims. Thus he suggests:

Where other agencies have already initiated biodiversity-advancing policies, the COP of the Biodiversity Convention might do well to identify and publicise problems that have been overlooked, and recommend improvements.⁷⁶

He goes on to submit that this would have the added benefit of managing more effectively the broad agenda which this study identified earlier on when considering the CBD's jurisdiction.⁷⁷

Unfortunately, there is a marked reluctance on the part of inter-governmental organisations such as UNEP, UNESCO and convention secretariats to surrender responsibilities once acquired. All too often they become embroiled in 'turf wars' for influence and funding support to maintain employees and programmes. Taking action

⁷⁶ Stone, *supra* n. 65 at 232.

⁷⁷ *Ibid.*

to remove duplication may not, therefore, be the easiest of tasks. It is consequently to be welcomed that the CBD has attempted to diffuse any potential conflicts through practical solutions based around its participation in the Biodiversity Liaison Group⁷⁸ and signing memoranda of cooperation with a large number of conventions. Focusing on the latter, these memoranda formulate joint work programmes and harmonise reporting requirements. A number of the MEAs considered in this study have entered into memoranda of cooperation with the CBD, such as the Convention on the Conservation of Migratory Species. Further, the Secretariat has been asked to seek collaboration with the regional seas conventions,⁷⁹ and other biodiversity related treaties such as the World Heritage Convention.⁸⁰

Given the realities of inter-governmental politics, the wide ranging jurisdiction of the CBD in both ecological and geopolitical terms, and the duplication of remit between the CBD and pre-existing treaties, the importance of the Biodiversity Liaison Group and memoranda of cooperation should not be underestimated in avoiding conflict and ensuring efficient use of time and resources for promoting MPAs and the conservation of coral reef ecosystems. This is particularly so given the difficulties which were encountered in trying to determine responsibilities between conventions based upon the CBD's provisions and legal reasoning.

4. ADMINISTERING THE CONVENTION

As is normally the case with international conventions, success in reaching objectives requires support in administrative terms. Parties need to meet regularly to assess

⁷⁸ Details on the Biodiversity Liaison Group were given in Chapter 5 and will be revisited in the conclusion to this study.

⁷⁹ Decision V/3, para 18.

⁸⁰ Decision IV/15, para 5.

progress, monitor compliance, take matters further forward and inter-act. These meetings need to be organised, draft documents produced, and information papers prepared. To provide such services, largely similar administrative structures have evolved across the spectrum of major MEAs, and the CBD is no exception.

Article 23 provided for COPs to be held in order to review the implementation of the convention. Initially these meeting took place annually, however, after 1996 and COP-3, this changed to every two years.⁸¹ As part of reviewing implementation, COPs may adopt decisions, protocols or amendments, assess scientific advice, and establish smaller groups to assist it with its work. Further, the COP should work towards fostering co-operation with other MEAs.

Assessing implementation can be seen to involve two different processes, namely (i) monitoring whether contracting parties are complying with their obligations, and (ii) evaluating the progress of the convention generally in advancing its three principal objectives. The success of the COP in fulfilling these aims depends upon different factors. As to (ii), the expertise of delegates at COPs will be important, and this theme is discussed in more detail later in this section.

Assessing compliance is more problematic for the COP than in the case of other MEAs, given the relative weakness of the mechanisms available under the CBD regime. No specific system exists for identifying non-compliance, such as is provided for by the Montreux Record under Ramsar or under the World Heritage Convention.⁸² The only materials available to the COP are the national reports required to be submitted at alternate conferences. This results in a heavy dependence upon a

⁸¹ The move to biennial meetings was formalised in changes to the Rules of Procedure agreed at COP-5 under Decision V/20.

⁸² See Chapters 8 and 9 respectively.

sufficient number of reports being filed in a timely manner, and upon the adequacy of the information provided. Whilst the national reports due to be submitted every other COP are supposed to include information on the effectiveness of measures to meet the CBD's objectives, this depends upon states being objective and honest in their appraisal. Further the development of indicators and baseline data on biological diversity is needed to help assess progress.

As well as the COP, the parties are supported by a permanent secretariat which was established under Article 24. The secretariat is based in Montreal and administered by UNEP.⁸³ Its principal function is to arrange and service meetings of the parties, although other responsibilities may be assigned to it as required to service the running of the regime.

One final administrative support body commonly employed by modern MEAs, is a specialist body to review and produce scientific advice on environmental issues pertinent to the regime's field. Article 25 established such a group to service the COP to the CBD, under the title of the Subsidiary Body on Scientific, Technical and Technological Advice ("SBSTTA").

The SBSTTA meets annually. The body provides answers to any scientific, technical, technological and methodological questions raised by the COP, and further produces scientific and technical advice on the status of biodiversity, the effects of measures taken under the CBD, best practices in sustainable use and conservation of biodiversity, and on the latest developments in scientific research.⁸⁴ In addition, the SBSTTA may set up ad hoc technical expert groups to deal with priority issues under

⁸³ Decision I/4.

⁸⁴ Article 25 (2).

the CBD's work programmes. As shall be seen later in this chapter, such ad hoc committees have been used to great value in considering coral reef ecosystem and MPA issues.

In the light of the administrative support structure which was outlined above, just how well equipped is the COP for effectively considering coral reef ecosystem issues?

Contracting parties may send a delegation to COPs, having provided the credentials of those attending to the executive secretary not later than 24-hours after the start of the meeting.⁸⁵ Nothing further is added, however, as to what credentials are desirable for delegates. United Nations agencies and non-contracting party states may attend as observers, however non-governmental organisations qualified in the fields of conservation and sustainable use of biological diversity must express their wish to attend as observers. Permission to attend will be given unless at least one-third of the parties present at a COP object.⁸⁶

In the case of the CBD, the range of matters it seeks to manage is so great that, in the absence of stricter guidance on delegates or observers, one might doubt the ability of such conferences to monitor and foster implementation and to further the convention's objectives. This flows from the need for delegates to be well versed in so many fields (including marine and coastal biodiversity) in order to understand and make valuable contributions to the items on any given agenda. It seems unlikely that developing states will be able to send such a qualified array of representatives⁸⁷

⁸⁵ Rules of Procedure for Meetings of the Conference of the Parties to the Convention on Biological Diversity (Annex to Decision 1/1, as amended by Decision V/20), Representation and Credentials, Rule 18.

⁸⁶ Article 23 (5).

⁸⁷ Except at times when they host COPs, providing the knowledge base is there in the first place

which, given the predominant distribution of coral reefs in developing countries, may be a particular problem.

One possible result is that those attending CBD COPs place a heightened degree of reliance upon the advisory reports of the SBSTTA when considering draft coral reef ecosystem decisions. The quality and accuracy of the SBSTTA's advice is therefore of particular interest.

The work of the SBSTTA depends upon a roster of experts, each of whom is a specialist in areas such as taxonomy, agricultural biodiversity, inland waters, and forests. These specialists make their expertise available on request in the form of, *inter alia*, peer review of documents, contributions to reports and participation in workshops. From the point of view of this paper, it is important to note that the Roster of Experts includes 40 people who claim to be specialists in coral reef habitats.⁸⁸ In comparison to other MEAs considered in this study, this pool of knowledge on such matters places the CBD in a strong position to produce valuable, up to date and accurate scientific and technical advice to the contracting parties.

In addition, the secretariat to the CBD co-ordinates work through individuals tasked to handle specific thematic programmes of work. For example, Marjo Vierros is responsible for the Jakarta Mandate programme of work on marine and coastal biodiversity. Marjo Vierros has, in this capacity, attended meetings of the International Coral Reef Initiative;⁸⁹ the inter-governmental forum for sharing and advancing scientific knowledge on coral reef ecosystems and their conservation.

⁸⁸ Information available on the searchable database of experts at www.biodiv.org.

⁸⁹ See, for example, *ICRI 2005 General Meeting - Summary Record (Palau, 31st October – 2nd November 2005)* available at www.icriforum.org.

In summary, the administrative structure of the CBD is highly developed in accordance with modern thinking on the needs of MEA regimes, and well placed to support programmes of work which support the conservation of coral reef ecosystems through MPAs. Any issues with developing countries lacking the strength in depth at COPs to consider coral reef ecosystem issues, is potentially balanced by a scientific body well equipped to produce high quality guidance on coral reef ecosystem scientific knowledge and conservation techniques.

5. THE ROLE OF PROTECTED AREAS UNDER THE CBD

There are two directions from which to analyse the CBD on MPAs and coral reef ecosystems – as a conservation strategy (i.e. what does the CBD say about (marine) protected areas) and as a habitat (i.e. what does the CBD say about conserving the marine environment and specifically coral reefs). Therefore, this study shall begin by considering the former (continuing such analysis in the following section), and then move on in section 7 to deal with provisions on coral reef ecosystems.

In discussing the conservation obligations under the CBD above, it was noted that Article 8 established detailed requirements for in-situ conservation of biodiversity. In particular, and of note for the purposes of this study when considering the promotion of MPAs as a conservation strategy under the CBD, Article 8(a) obliges contracting parties (as far as possible and as appropriate) to establish a system of protected areas⁹⁰ or areas where special measures need to be taken to conserve biodiversity. Suitable guidelines should be drawn up for selecting and managing these sites.⁹¹ Biological

⁹⁰ “Protected Area” is defined as a geographically defined area which is designated or regulated and managed to achieve specific conservation objectives. (Article 2)

⁹¹ Article 8(b).

resources, as defined in Article 2,⁹² must be managed within (and outside) the protected area with a view to ensuring their conservation and sustainable use.

The prominent role afforded protected areas as a strategy in the substantive parts of the CBD on in-situ conservation measures is further reflected in the various work programmes drawn up for particular habitats. As will be seen in the following section, protected areas in the form of MPAs are a key element in the marine and coastal biodiversity programme, as indeed they are in the forest, inland water and mountain biodiversity programme.⁹³

The CBD, having devised such programmes and promoted enclave strategies, has been keen to assess progress on protected areas. 2004 (the year of the 7th COP) had, since 1998,⁹⁴ been ear-marked as the time for an in-depth review of progress and to plan for the future. As part of the preparation for COP-7, contracting parties were therefore requested to submit thematic reports on protected areas which could be used to supplement their national reports.⁹⁵ In 2003, the findings from this exercise were summarised by the CBD secretariat in two information documents⁹⁶ designed to prepare contracting parties for COP-7 at which it was hoped a resolution on progress

⁹² "Biological resources" includes genetic resources, organisms or parts thereof, populations, or any other biotic component of ecosystems with actual or potential use or value to humanity. (Article 2)

⁹³ See, for example, Decision IV/7, Annex, para 52, which provides for using protected areas to conserve forest biodiversity, together with monitoring this strategy to assess how it contributes to sustainable use and as to the adequacy of the areas as a network.

⁹⁴ Decision IV/16.

⁹⁵ Decision VI/25.

⁹⁶ *Status and Trends of, and Threats to, Protected Areas* (UNEP/CBD/SBSTTA/9/5/Rev.1), 23 September 2003 and *Synthesis of Information in Thematic Reports on Protected Areas* (UNEP/CBD/SBSTTA/9/INF/2), 27 October 2003.

and a programme for future work on protected areas would be negotiated and adopted.

From the reports submitted, together with data provided by the UNEP World Conservation Monitoring Centre and the United Nation's *World List of National Parks and Equivalent Reserves*, a number of facts were established and concerns identified. First, whilst there had been a four-fold increase to 12 million km² of habitat within protected areas between 1970 and the late 1990's, terrestrial parks predominated. 11% of the Earth's land surface was contained in such enclaves, whilst MPAs only protected 0.5% of the world's oceans.⁹⁷

With respect to implementation of Article 8, the small sample of thematic reports submitted did not help to draw firm conclusions; however, the majority of reporting states gave a high priority to protected areas as a conservation technique and had a policy framework and/or legal mechanisms in place to support a protected area programme. Again, around 85% either had or were in the processes of assessing threats to protected areas and the habitat they were in place to manage. Just under half of the respondents had a system in place for developing and managing protected areas.⁹⁸

Limitations to progress and assessing the work of the CBD were also recognised. First, reports to the CBD were not designed to give any indication of conservation achievements or outcomes from protected areas. Judging the success of protected areas with respect to convention objectives was therefore impossible. Further, many

⁹⁷ *Status and Trends of, and Threats to, Protected Areas*, *ibid* at 5. Whilst there is clearly an imbalance, this might, at least, be attributable to only a proportion of the oceans falling within a single state's jurisdiction.

⁹⁸ See *supra* n. 96 at 4 for all statistics,

of the developing states found lack of funds and suitably qualified personnel to manage such areas a hindrance to their effective implementation of enclave strategies.⁹⁹

In the run-up to COP-7, this exercise had therefore identified a number of key areas for improvement. First, the imbalance in the number of terrestrial and marine protected areas needed to be addressed. Second, more needed to be done by contracting parties to utilise systems for evaluating the effectiveness of protected areas against the original purpose for which any given enclave was established. Third, targets needed to be established for the number of protected sites and their effectiveness, preferably in line with the call for a global network of protected areas issued at the World Summit for Sustainable Development. Finally, deficiencies in capacity building clearly remained a major obstacle to success.

In February 2004, the 7th meeting of the contracting parties in Kuala Lumpur duly decided to adopt a dedicated programme of work for protected areas. The overall objective of this programme is to establish, by 2010 with respect to terrestrial areas and by 2012 in relation to marine areas, a comprehensive system of effectively managed, representative and networked protected areas.¹⁰⁰ Given the various benefits to conservation and resource management, this objective would contribute to the three objectives of the CBD under Article 1. To achieve this, the programme chose 16 goals together with target dates and suggested activities that could be undertaken by contracting parties to reach these goals.

⁹⁹ *Ibid.*

¹⁰⁰ Decision VII/28, para 18.

The programme is highly detailed and comprehensive, reflecting many of the best practices that were discussed in Chapter 4, such as the involvement of local communities¹⁰¹ (which is also an obligation under the CBD as noted previously) and the need to place enclaves within wider conservation and management plans which look beyond the boundaries of parks.¹⁰² The programme also covers many of the concerns identified in the pre-COP work of the Secretariat, such as capacity building.¹⁰³ Space constraints do not permit a full appraisal of each goal and activity; however, some demand attention in the context of this paper.

Goal 1.1 sets out the general objective to create a global network of representative, effectively managed, protected areas by 2010 and 2012 for terrestrial and marine ecosystems respectively. The path towards this objective is set out in the suggested activities for states, namely, to set national targets and indicators by 2006, and urgently expand or establish protected areas for threatened or key habitats or species. By 2008, it is suggested that parties should have taken urgent action to increase representation of marine and coastal ecosystems, such as coral reefs. This would be assisted by the suggested review of gaps in a potential network of protected areas, which should be completed by 2006 and lead to designations by 2009.

Goal 1.5 seeks to address threats to the proposed network of protected areas by requiring effective mechanisms to be in place by 2008 for identifying and preventing or mitigating negative impacts. The suggested activities for parties then highlight the usual steps, such as environmental impact assessment, damage response measures

¹⁰¹ Programme of Work on Protected Areas, Goal 2.2.

¹⁰² *Ibid*, Goal 1.2.

¹⁰³ *Ibid*, Goal 3.2.

like liability regimes and rehabilitation of damaged ecosystems, and finally adequate enforcement of restrictions within protected areas.

The programme of work is highly commendable, being comprehensive and up-to-date. It offers much to the promotion of MPAs and thereby the conservation of coral reef ecosystems. Many of the goals and target dates are ambitious but clearly the CBD recognises that much needs to be done (and quickly) to improve the effectiveness and coverage of MPAs. The CBD seems well aware of this, and of the fact that whilst it has been successful in formulating programmes in the past, the need now is to improve implementation. Consequently, the CBD has commendably resolved to establish a permanent working group to monitor implementation and progress, and which will report to every subsequent COP, thereby providing a basis for regular assessments by the contracting parties up to 2010.¹⁰⁴

This progress does, naturally, throw up some potential difficulties which will need to be addressed. The regular review of implementation will presumably rely upon parties providing reports or information, although the poor response to the thematic report request in the run up to COP-7 does not bode well in this respect. As a result, information has had to be acquired through databases maintained under the auspices of other conventions, most notably the Ramsar Convention on Wetlands.¹⁰⁵

In addition, and as the RSPB were so keen to point out, the network will require funding and other forms of support from developed nations, yet no concrete commitments have been made to this end. Past experience of the political forum that

¹⁰⁴ For the first such report, see *Report of the First Meeting of the Ad Hoc Open-Ended Working Group on Protected Areas* 20th February 2006 (UNEP/CBD/COP/8/8).

¹⁰⁵ *Review of the Implementation of the Programme of Work on Protected Areas for the Period 2004-2006. Note by the Executive Director* 1 February 2006, at para 16.

is the CBD suggests that the willingness (and ability) of developing countries to implement the protected areas programme will turn, in large part, on such considerations. Again, experience to date with respect to inadequate support for developing countries does not bode well.

Finally, given the theme of national implementation, sovereignty over natural resources and the desire to keep the international community at arms length, the programme of work for protected areas allows ample discretion to contracting parties. Thus parties are urged (not obliged) to meet these goals, whilst the CBD also recognises that implementation will be in the context of each contracting party's own priorities, capacities and needs.¹⁰⁶ It should also be remembered that the activities, and therefore road map dates, are only suggested ways to meet the goals of the programme. The CBD therefore faces a difficult task to ensure that the goals are meaningfully met without the time frame slipping too far.

The new programme for promoting protected areas is a significant achievement for the CBD and the integration of means to monitor implementation is a positive inclusion. The proposed network could have significant benefits for the conservation of coral reefs within MPAs.

6. THE JAKARTA MANDATE

The programme of work on protected areas is clearly intended to promote an effective and comprehensive network of MPAs. As recognised by the protected areas programme,¹⁰⁷ however, it cuts across other measures adopted under the CBD to conserve marine and coastal biodiversity. This study must therefore consider how

¹⁰⁶ Decision VII/28, para 19.

¹⁰⁷ *Ibid*, para 20.

MPAs are incorporated and promoted under the CBD's work with respect to the marine environment.

The CBD has adopted a number of thematic programmes of work based around generally grouped habitat types, e.g. inland waters, mountains, dry-lands and forests. One such programme focuses upon the marine and coastal environment, and MPAs form an integral part of this plan.

At the request of the first COP, the SBSTTA convened in Paris in September 1995 in order to draw up a study on, and recommendations for, conserving marine and coastal habitats. The resulting recommendation¹⁰⁸ suggested a programme of work focused around 5 actions: implement integrated coastal zone management,¹⁰⁹ establish and maintain MPAs,¹¹⁰ manage living resources in a sustainable manner,¹¹¹ ensure that mariculture is conducted sustainably,¹¹² and control or eradicate harmful alien species.¹¹³

The second COP held in Jakarta in November 1995 supported the recommendations subject to further development by the SBSTTA and future COPs, and stated its belief that the recommendations were a solid basis for future action.¹¹⁴ This move was given further backing in the ministerial statement which was issued at the conclusion of COP-2. Here, the participating ministers reaffirmed:

¹⁰⁸ SBSTTA Recommendation I/8, "Scientific, technical and technological aspects of the conservation and sustainable use of coastal and marine biological diversity".

¹⁰⁹ *Ibid*, para 10.

¹¹⁰ *Ibid*, para 11.

¹¹¹ *Ibid*, para 12.

¹¹² *Ibid*, para 15.

¹¹³ *Ibid*, para 16.

¹¹⁴ Decision II/10.

that there is a critical need for the Conference of the Parties to address the conservation and sustainable use of marine and coastal biological diversity, and urge parties to initiate immediate action to implement the decisions adopted on this issue.¹¹⁵

The programme was referred to as the Jakarta Mandate in the ministerial declaration and has since been known as such.¹¹⁶ Following that event, and in support of the mandate, formal programmes of work have been adopted – the first being agreed at COP-4 in 1998,¹¹⁷ and which included two objectives for promoting MPAs.¹¹⁸

The Jakarta Mandate's objectives and work programmes on MPAs are supported by a dedicated ad hoc technical expert group. This group recently completed a review of MPAs and marine and coastal biodiversity in preparation for the 2004 seventh COP, since this COP was due to consider progress under the Jakarta Mandate and formulate an updated programme of work.¹¹⁹ As would be expected, the report reflects much of the current consensus on MPAs, namely their importance within integrated coastal zone management plans and their ability to control particular threats to marine

¹¹⁵ "The Jakarta Ministerial Statement on the Implementation of the Convention on Biological Diversity", para 14, available at www.biodiv.org.

¹¹⁶ For general reading on the Jakarta Mandate see A. C. De Fontaubert, D. R. Downes and T. S. Agardy, *Biodiversity in the Seas: Implementing the Convention on Biological Diversity in Marine and Coastal Habitats* (IUCN) (1996).

¹¹⁷ Decision IV/5 adopted following SBSTTA Recommendation III/2.

¹¹⁸ Wold's criticism of the CBD for having adopted the Jakarta Mandate and then dropped it to pursue other pet issues may therefore, in hindsight, be off the mark (*supra* n. 46 at 12). Admittedly Wold was writing before COP-4, however as suggested earlier, much was going on in the background in *ad hoc* meetings and the SBSTTA.

¹¹⁹ Report of the Ad Hoc Technical Expert Group on Marine Protected Areas, *Marine and Coastal Biodiversity: Review, Further Elaboration and Refinement of the Programme of Work* 13 February 2003 (UNEP/CBD/ SBSTTA/8/INF/7).

biodiversity such as over-exploitation, unsustainable extraction methods and impacts from tourism.¹²⁰ However, like the conclusions being reached on protected areas in general (which were noted in the previous section), the ad hoc group also felt that existing MPAs were not effective because of, *inter alia*, lack of financial and technical support, inadequate enforcement, external impacts and lack of networks of parks.

The group then proposed a guiding mission for a revised programme:

The establishment and maintenance in perpetuity of an effectively managed, ecologically representative global system of [MPA] networks, where human activities are managed to maintain the structure and functioning of the full range of marine and coastal ecosystems, to provide benefits to both present and future generations.¹²¹

This goal also reflected ambitions for MPAs expressed at the 2002 World Summit on Sustainable Development. Consequently, the ad hoc group adopted the same target date for completion of this mission, namely 2012. Further, progress towards the goal would require co-ordination in data collection, particularly with other MEAs, such as Ramsar and the World Heritage Convention. A proposed set of standard data was provided in the report.

Following this report, in 2003 the SBSTTA produced a complete draft for a revised programme of work on marine and coastal biodiversity under the Jakarta Mandate. As per the first plan agreed in 1998, the revision was to include a programme element on MPAs. The revised programme element as proposed adopted the ad hoc group's

¹²⁰ *Ibid*, paras 14, 11 and 12 respectively.

¹²¹ *Ibid*, para 23.

overall goal as set out above, save for added emphasis on the link between national networks of MPAs being a basis for the desired global network.¹²² Further, it was hoped that the pursuit of four objectives would lead to the fulfilment of the overall goal, namely:

1. Developing national and regional networks of MPAs, paying attention to designating new parks and incorporating multiple use planning so that some areas may prohibit all extractive activities, whilst others could permit sustainable use;
2. Managing MPAs in a more effective manner through, *inter alia*, better compliance and enforcement, controlling external threats through Integrated Coastal Zone Management, and through community involvement;
3. Improving monitoring of national and regional systems of MPAs;
4. Improving knowledge and capacities on MPAs.

Crucially, the proposed revised programme of 2003 sought to include concrete targets to be achieved by 2010.¹²³ Of particular significance was proposed Goal 1 on maintaining the diversity of ecosystems, habitats and biomes. Target 1.1 was that 10% of each marine and coastal ecological region should be effectively conserved. This clearly envisaged increasing the total area of MPAs, as well as increasing representation of different marine and coastal ecosystems in MPAs. Further, Target 1.2 said 30% of known tropical and cold water coral reefs and seamounts should be

¹²² *The elaborated programme of work on marine and coastal biological diversity*, 28 November 2003 (UNEP/CBD/COP/7/12/Add.2)

¹²³ *Outcome-oriented targets for the implementation of the elaborated programme of work on marine and coastal biological diversity*, 3 December 2003 (UNEP/CBD/COP/7/20/Add.5)

effectively protected either through MPAs or other state controls such as fishing restrictions.

The significance of these proposals lies in the desire to move away from purely general policy formulation towards measurable action and implementation in accordance with the next phase of the CBD's development.¹²⁴ If acceptable to states, targets can then be used not just to encourage real action, but also to help judge progress towards the convention's objectives. Of course such targets must be acceptable to the parties and the SBSTTA's proposals therefore needed approving by the COP.

COP-7, the following year, brought about mixed results in this regard. First, by Decision VII/5, the contracting parties adopted a new Elaborated Programme of Work on Marine and Coastal Biological Diversity (hereafter the "EPW").

The EPW of 2004 has two interesting features in relation to MPAs. Objective 3.4, relating to supporting and monitoring national and regional networks of MPAs, requires contracting parties to provide up-to-date information on their marine parks to UNEP/WCMC. In essence, this seems to be the loose beginnings of a list or database of all MPAs for the purposes of the CBD, albeit being introduced through the back door rather than through treaty provision.¹²⁵ Second, the programme calls for work to be completed on devising a mechanism for creating and designing the desired networks of MPAs.¹²⁶ In the author's opinion, this is of paramount importance. The desire for a network is clear, though the project lacks clear definition. The programme

¹²⁴ See further Decision VII/30, *Strategic Plan: Future Evaluation of Progress* for the growing trend towards gauging implementation against targets and goals.

¹²⁵ *Supra* n 123, Operational Objective 3.4, Suggested Activity (b).

¹²⁶ *Supra* n 123, Operational Objective 3.5, Suggested Activity (b).

includes some hints as to what is meant by a “network” which are scattered in various annexes, but what is needed is for these ideas to be extracted and developed into a user-friendly guide for contracting parties and the implementing authorities within states.

Despite the advances achieved through the adoption of the EPW, COP-7 failed to agree the goals and targets also proposed by the SBSTTA in 2003. Instead, the programme simply refers the matter back to the SBSTTA to refine the goals and targets in accordance with those which were set at COP-7 for the CBD in general under decision VII/30.¹²⁷ The head of the WWF delegation to COP-7 said:

The failure of the Parties to the CBD to adopt specific objectives for the protection of the oceans is all the more disappointing as strong proposals prepared for the meeting mysteriously failed to reach the conference table.¹²⁸

It should be pointed out that from a pure MPA point of view, this outcome had a limited impact as the goals agreed under decision VII/30 did include a target for 10% of all global ecosystems to be conserved.¹²⁹ Thus only the SBSTTA’s 30% target for coral reefs and seamounts mentioned earlier was lost.

COP-8 did little to move matters forward. The contracting parties were willing to refine targets, however this was only on the basis that such targets were:

a flexible framework within which national and/or regional targets may be developed, relevant to the implementation by Parties of the programmes

¹²⁷ *Supra* n 123, para 3.

¹²⁸ WWF Press Release, *CBD moves forward on protected areas, stumbles on oceans* 20 February 2004.

¹²⁹ Decision VII/30, Annex II, Goal 1, Target 1.2.

of work and National Biodiversity Strategies and Action Plans, according to national and/or regional priorities and capacities, taking into account differences in biological diversity between countries.¹³⁰

Additionally, there was no mention of the 30% target for coral reefs and seamounts.¹³¹

To summarise, the work of the CBD in relation to marine and coastal biodiversity, (which includes coral reefs) has, since the early plans under the Jakarta Mandate, accorded MPAs a central role. The CBD has demonstrated a sound knowledge of the role MPAs can play in conserving such ecosystems, from controlling human impacts to increasing fish stocks. This good work has now progressed under the EPW adopted at COP-7, with a move away from expressions of general intent or policy towards concrete actions which can be monitored, aiding implementation assessment. Whilst much is still left to contracting parties and action at the national level, this development does bring the international community closer to looking over contracting states' shoulders to see that appropriate steps are actually being taken. Enhancing data collection and emphasising the need for information to be collected by UNEP/WCMC on MPAs, also helps towards this end. All of this can help the CBD to generate the peer pressure which is a key factor in bringing about compliance with its obligations. However, as has been shown, this new approach has been somewhat weakened by the recent decisions of the COP on introducing the goals and targets drawn up by SBSTTA for the EPW.

¹³⁰ Decision VIII/15.

¹³¹ *Ibid.*

7. ADDRESSING CORAL REEFS

So far this study has concentrated upon those initiatives and decisions under the CBD which are concerned with MPAs, whether as part of the protected areas programme of work, or under the thematic work being performed in relation to marine and coastal biodiversity. In essence this has revealed how MPAs play a key role under the CBD, and how aware the convention is both to their importance in advancing conservation objectives and to shortcomings in progress to date in the distribution and management of MPAs. Further, it has been noted that the CBD is commendably moving from policy formulation, towards strengthening implementation. One final direction, therefore, now needs to be explored for the purposes of this thesis. Are there any initiatives under the CBD relating to coral reef ecosystems specifically and, if so, do these impact upon MPAs as a strategy for their conservation?

As has been noted, in 1998 Decision IV/5 on conservation and sustainable use of marine and coastal biodiversity set out in full the first programme of work under the Jakarta Mandate. The same decision noted with concern the 1997-8 occurrences of coral bleaching which it was suspected were linked to increased water temperatures and therefore ultimately to climate change. As a result, the SBSTTA was asked to investigate the problem and prepare a report for the following COP,¹³² whilst the Executive Secretary was instructed to express the CBD's concerns over coral bleaching to the UN Framework Convention on Climate Change executive secretary so that the parties to that MEA could deliberate on the issue.¹³³ The initial programme

¹³² Decision IV/5, para II (1).

¹³³ *Ibid*, para II (2) and (3).

of work also included a call for contracting parties to the CBD to develop policies for restoring degraded habitat, particularly coral reefs.¹³⁴

As a result of this decision, COP-5 in 2000 added further elements relating to coral reefs into the programme of work on marine and coastal biodiversity.¹³⁵ These additions focused upon four issues: information gathering, capacity building, financing, and policy development and implementation. Of particular importance to this study is the recognition in these additions of the fact that negative human impacts upon coral reefs exacerbate the effects of coral bleaching. Further, concerns were expressed that MPAs may not alone be enough to mitigate the effects of climate change and bleaching.¹³⁶

The role of protected areas in helping damaged habitats to recover has been more clearly noted in other CBD documents,¹³⁷ and, further, the CBD seems to be well aware of the importance of MPAs in optimising the health of reefs in order to enable them to recover from the damage caused by coral bleaching. Thus in the proposed targets and goals for the EPW, the SBSTTA noted recent research that highly protected reefs are better able to recover from bleaching. Such high protection could be achieved through MPAs.¹³⁸

In addition to the existing four areas of work adopted at COP-5, the EPW has added a fifth concerned with management actions and strategies aimed at supporting reef resilience and recovery from bleaching events. Under this new theme, parties will be

¹³⁴ *Supra* n. 132, Part C, Programme Element 1.3 (c).

¹³⁵ Decision V/3, para 3 and Annex thereto.

¹³⁶ *Ibid*, Annex, Part C.

¹³⁷ See for example *supra* n. 96 para 32 (a).

¹³⁸ *Supra* n. 123, Overall Target 1.2, technical rationale.

encouraged to integrate resilience to bleaching principles into MPA management and design. Overfishing and water quality are specifically highlighted as factors in determining resilience.

Finally, having spent some time starting to tackle coral bleaching, the CBD is now beginning to develop a work plan to reduce physical degradation and destruction of coral reefs. This plan, which can supplement the work on coral bleaching through improving coral health and thus resistance to long-term damage, is at a very early stage of development. The EPW thus talks in general terms about information gathering, capacity building, education, financing and management, although at this stage the potential role of MPAs has not been elaborated upon.¹³⁹

With respect to coral reefs, the CBD has quite rightly been particularly concerned with mitigating the effects of coral bleaching, as this is currently the biggest threat they face. The evidence suggests that the CBD is aware that healthy reefs are better placed to recover from such events and that MPAs are consequently a key part in any strategy to deal with bleaching. This is to the credit of the CBD.

8. NATIONAL IMPLEMENTATION BY CORAL REEF STATES

In considering the measures taken by the CBD with respect to MPAs, either as part of the protected area programme or as part of the Jakarta Mandate, some reference has been made to the various reports which have been submitted by contracting parties. These reports should form the basis for considering implementation of the obligations previously discussed in earlier sections of this chapter. By giving some consideration to the reports submitted by the contracting parties in whose jurisdiction coral reef

¹³⁹ *Ibid*, Appendix II. This plan can be traced back to the 6th meeting of the SBSTTA in 2001 (Recommendation VI/2).

ecosystems are located,¹⁴⁰ an insight can hopefully be gained into the impact of the CBD in these countries and thereby the current and potential influence of the programmes and obligations which have been discussed in previous sections.

The following observations are based upon a consideration of the reports submitted, and in particular those produced in the English language. In that context, an important limitation should be noted regarding the current reporting structure. It is difficult to establish from the reports just what has been achieved as a result of the CBD since they tend to describe a state of affairs, rather than to identify systematically what has been done by states to implement the convention. With the CBD moving increasingly towards analysing implementation, changes may occur in the pro formas for future reports. In the meantime, however, the information which they provide is only of limited value.

To date, a total of three reports should have been filed by each contracting party with the secretariat, plus a thematic report on protected areas. Whilst coral reef states who have only recently become contracting parties to the CBD may be forgiven for having not filed reports, compliance with reporting requirements is varied. A total of nine of the 80 coral reef states have yet to file any report, whilst another two have completed only a thematic report on protected areas. On the other hand, nine states have filed all of their reports, with a further 13 having submitted all of their reports with the exception of the report on protected areas. Only 28 coral reef states had submitted the required report in advance of COP-8 due to be held in 2006.¹⁴¹

¹⁴⁰ Refer to Annex I for further details of these states.

¹⁴¹ Designated as Report No. 3.

Given this record, a reasonable overall degree of commitment to the CBD by coral reef states can be recognised. At the same time, there may be justifiable concern that a total failure to report reflects poor commitment within some significant countries.¹⁴² Thus the failure by Papua New Guinea to comply with these basic obligations is particularly troubling given that the state is home to 4.87% of global coral reefs; the sixth largest concentration in the world.

The reports themselves conform to patterns already noted with respect to implementation of the CBD generally. Thus the majority of coral reef states consider in-situ conservation to be highly important although most find that the resources and capacity to pursue such conservation initiatives is at least limiting, and in a few cases extremely limiting. The same can be said with regard to the importance of conserving marine and coastal biodiversity and the limitations on such efforts.¹⁴³

With few exceptions, relatively complete networks of protected areas exist within coral reef states, whilst a number of those not falling into this group are in the process of establishing such networks. Unfortunately, the majority of reports submitted do not

¹⁴² For support of this view see Sands' comments, *supra* n. 36 at 868:

"... compliance with basic reporting requirements under environmental treaties remains inadequate... if states are unable or unwilling to fulfil these primary obligations then it is unlikely that they will comply with the more onerous and important substantive standards established by the same treaties."

¹⁴³ The third report of India, submitted for COP-8, indicates the level of attention being paid by some coral reef states to coral reefs and protected areas. India is planning further MPAs and will also be focusing upon conservation and management of coral reefs in the four principal areas in which these habitats are found. Indonesia is a further example. Their third report indicates that they have set a target for 2010 of having 10 million hectares of marine conservation areas, and that within their marine conservation areas there will be programs for rehabilitation, and sometimes transplanting, of coral reefs.

systematically indicate the extent to which MPAs play a part in these networks. Nevertheless, a number of interesting points can be extracted from the reports.

The first is the problem which arises in pursuing enclave, and therefore MPA, strategies in states where systems of community land tenure persist; this is sometimes the case for Pacific Island nations, such as Samoa,¹⁴⁴ and Papua New Guinea.¹⁴⁵ In such instances, governments have limited rights over land or coastal zones held by communities and therefore without the involvement and consent of such communities, the formal designation of state controlled protected areas is not possible. Instead, biodiversity action plans and strategies must adapt to more informal community-run approaches.

Secondly, the reports highlight the need to improve capacity and resources in all but a few coral reef states. Barbados, for example, notes in its second report that whilst protected areas have been incorporated into the national biodiversity strategy, lack of financial resources is affecting its ability to strengthen institutions to support the planned network, as well as to train personnel. Funding from the GEF has helped overcome some of these problems in some states. Eritrea, with coral reefs found along its Red Sea coast, has used such funding to develop MPAs in this area. Vanuatu has also received some funding which has helped its small government agency to identify three possible areas for protection. However, the fact that this funding has not been assured in the long term casts doubt about the future for these areas.

¹⁴⁴ For a case study, see M. King and U. Faasili, "A network of small, community-owned village fish reserves in Samoa" [1998] 8(2) *Parks* 11.

¹⁴⁵ R.V. Salm and J.R. Clark, *Marine and Coastal Protected Areas: A Guide for Planners and Managers* (IUCN) (2000) at 135.

The reports therefore highlight that, whilst coral reef states have been able to plan, or are planning, systems of protected areas (including some MPAs), the lack of resources and capacity to maintain these enclaves remains in doubt. This might not be such a surprise given the predominant distribution of coral reef ecosystems in developing nations, but it does highlight the particular importance, as was noted earlier in this chapter, of substantial financial support coming from developed countries if the CBD's programmes for MPAs (and thereby potentially coral reef ecosystems) are to be effectively implemented.

9. CONCLUSIONS

The Convention on Biological Diversity has succeeded in bringing a large number of states within a single MEA regime charged with a comprehensive agenda for conserving biodiversity, ensuring the sustainable use of its components, and the fair and equitable sharing of the benefits arising from the use of genetic resources (including access to genetic resources and technology transfer). In turn, this throws up particular problems, namely focusing the agenda in a detailed and meaningful way, managing external relations with other MEAs and garnering consensus among so many contracting parties in what has historically been a highly politicised negotiating environment.

Against this background, an assessment of the way in which the CBD attempts to promote the use of MPAs as a way to conserve coral reef ecosystems has been undertaken. To this end, it has been seen that these ecosystems fall within the regime's remit, and that the geopolitical coverage of the CBD is particularly strong. The programmes of work on the marine and coastal environment, as well as on protected areas, are undergoing a welcome development from the initial,

predominantly descriptive, policy formulation stage. Thus a move by the CBD to focus its work more effectively, particularly through detailed goal and target setting, can be discerned. This will enable the regime to better monitor implementation. This represents much needed progress, even if the current targets are incomplete and drafted in worryingly flexible terms.

The goal of establishing a network of effectively managed MPAs by 2012, if achieved, could have far reaching benefits for coral reef ecosystems. Success may, however, turn on a number of key factors. As was highlighted early on in the chapter (and borne out in the national reports of coral reef states), increasing capacity in financial, institutional and human terms is very important. Whilst the legal implications of failure to provide such assistance may be open to debate, the practical implications may be less so. Further, the CBD will need to find a way to effectively bring about action and assess progress in a regime averse to international monitoring, and lacking tools such as lists of protected areas. Ultimately, this may prove to be beyond the capability of the CBD, and partnerships with other MEAs which do not suffer from such restrictions may become important. The reliance on data collected under the Ramsar Convention is, perhaps, an early indication of the role such external regimes will need to play in helping the CBD pursue some of its work programmes.

It is therefore very important for the CBD to find a way to effectively manage and run programme elements which promote the conservation of coral reef ecosystems through MPA strategies. In the event that other MEAs may be promoting the designation of MPAs, particularly for coral reefs, as well as improving management of such enclaves, it would serve the regime well to sub-contract responsibility elsewhere. This is particularly important in the light of the exceptionally broad agenda faced by the convention, and will ensure a more efficient use of time and

resources. Early signs of such moves have been recognised in memoranda of co-operation and in decisions of the COP. This may well mark a turning point in international environmental matters as the old sectoral MEAs, which may have feared being sidelined, or felt the need to adapt to policies and philosophies of the widely supported CBD, are recognised as of importance to the meeting of the CBD's own objectives.

Following recent developments, the CBD is seeking to achieve much which can benefit the conservation of coral reef ecosystems through the use of MPAs. The regime has also demonstrated the commitment of coral reef states to such strategies, whilst also highlighting the potentially undermining effects of lack of capacity. Ultimately, however, the CBD may not be agile enough because of remit and political factors, nor suitably equipped as a regime, to achieve its goals for MPAs without direct assistance from other MEAs. Whilst clearly of major importance for the promotion of coral reef ecosystem conservation through MPA strategies, the CBD may not therefore represent a complete solution in international law.

**CHAPTER EIGHT – THE CONVENTION ON WETLANDS OF INTERNATIONAL
IMPORTANCE, ESPECIALLY AS WATERFOWL HABITAT**

1. INTRODUCTION

In terms of an international legal response for the conservation of coral reef ecosystems, Mary Davidson recently concluded that the United Nations Convention on the Law of the Sea,¹ the Convention on Biological Diversity,² the Convention on International Trade in Endangered Species and the World Heritage Convention³ have and continue to afford varying forms of protection to coral reefs.⁴ Unfortunately, and together with the Convention on Migratory Species,⁵ Davidson overlooked the 1971 Convention on Wetlands of International Importance Especially as Waterfowl Habitat,⁶ otherwise known as the Ramsar Convention after the Iranian town where it was adopted (hereafter “Ramsar”). This may be a forgivable oversight, however, since one senior advisor to Ramsar recently noted that:

¹ See Chapter 6.

² See Chapter 7.

³ See Chapter 9.

⁴ M.G. Davidson, “Protecting Coral Reefs: The Principal National and International Legal Instruments” (2002) 26 *Harv. Envtl. L. Rev.* 499 at 527-39. In addition, certain non-treaty based initiatives exist at the inter-governmental level, notably the International Coral Reef Initiative and UNESCO’s Man and the Biosphere Programme (See Chapter 5).

⁵ See Chapter 10.

⁶ 996 U.N.T.S. 245.

the Ramsar Convention on Wetlands [includes] coral reefs but that, unfortunately, this [is] not well known, particularly among governments.⁷

In 1984, Sue Wells identified Ramsar's potential for protecting coral reefs.⁸ At the time, she noted that there was a need for the international community to support states already taking action to protect reefs, and that international recognition of sites would assist these national efforts. Ramsar offered a mechanism for such recognition, although Wells' research suggested that since only nine states with jurisdiction over coral reef ecosystems were then parties to Ramsar, and an even smaller number of sites had actually been listed under the convention, Ramsar's potential was largely unrealised.

This chapter therefore seeks to fulfil a number of aims. In general, it is important to understand how Ramsar promotes marine protected areas ("MPAs") and the conservation of coral reef ecosystems. It will become clear in the course of this chapter that the value of Ramsar for promoting the conservation of coral reefs through MPAs is growing steadily. That growing importance becomes apparent through updating the status of coral reefs under Ramsar since Wells' study of 1984. That particular task will be undertaken through a detailed assessment of the current geographical coverage of Ramsar and progress in designating coral reef sites, together with a review of other developments under the convention. Finally, with a number of multilateral environmental agreements ("MEAs") being influential in conserving coral reefs, as reflected in Davidson's review, an assessment of Ramsar's merits for dealing with coral reefs will be undertaken.

⁷ Margarita Astralaga, Ramsar Senior Advisor for the Americas, quoted by the International Coral Reef Initiative Co-ordinating and Planning Committee, *Report of the Meeting*, Gland, Switzerland, May 8-9, 2003.

⁸ S. Wells, "Coral Reefs and the Ramsar Convention" (1984) 15(4-6) *IUCN Bulletin* 56.

2. THE RAMSAR CONVENTION

For the purposes of this chapter, it is useful at this stage to provide a general introduction to Ramsar. However, as this study aims to focus attention upon the promotion under Ramsar of the conservation of one wetland type (coral reefs), it is not intended to serve as an analysis of the convention as a whole. Many able studies have already been undertaken in that regard.⁹ This section will therefore provide the reader with a general primer on the convention, whilst examining a few provisions in greater detail on the basis of their particular relevance to arguments developed in later sections of this chapter.

2.1 BACKGROUND TO THE CONVENTION'S CONCLUSION

In 1971, the year before the UN Conference on the Human Environment was held in Stockholm, the Ramsar Convention was concluded as the first global agreement to deal with a particular habitat. Wetlands had long been the subject of land reclamation and drainage, despite their significance for regulating water levels and as habitat for fish, reptiles and waterfowl. The loss of wetland habitat was therefore taking place on a large scale, causing particular concern to ornithological non-governmental organisations. These groups led the negotiations for what eventually became the

⁹ It is suggested that the reader give due consideration, *inter alia*, to the following texts for a more comprehensive analysis of Ramsar: S. Lyster, *International Wildlife Law* (CUP) (1985), Chapter 10; C. de Klemm, *The Legal Development of the Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat* (Ramsar Convention Bureau) (1995); M. J. Bowman, "The Ramsar Convention Comes of Age" (1995) 42 *Netherlands International Law Review* 1; D. Farrier and L. Tucker, "Wise Use of Wetlands Under the Ramsar Convention: A Challenge for Meaningful Implementation of International Law" (2000) 12(1) *JEL* 21; C. Shine, "Biological Diversity and the Ramsar Convention on Wetlands" (2001) 48 *Environmental Encounters* 49; M.J. Bowman, "The Ramsar Convention on Wetlands: Has it Made a Difference" in *Yearbook of International Co-operation on Environment and Development 2002/2003* (Earthscan) (2002) 61.

Ramsar Convention, a fact which continues to be reflected in the full title and certain provisions of the convention and despite attempts to distance the regime from such an apparent focus upon waterfowl.¹⁰ Ramsar has thus had to contend with ensuring that the full spectrum of wetland habitats were being protected under its auspices and attracting membership of states who may have felt that the convention was only relevant to waterfowl conservation and therefore did not fit with their own priorities. Further, it has had to adapt its practices to reflect the gradual development of modern environmental law since the Stockholm Conference.

2.2 DEFINING AND SUB-DIVIDING WETLANDS

Ramsar recognises that wetlands are important regulators of water regimes and, more particularly, act as habitats supporting characteristic flora and fauna.¹¹ As such, therefore, Ramsar was the first MEA to address the conservation of a particular habitat – i.e. those collectively regarded as wetlands. The definition of wetland was established in Article 1(1) as:

areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres.¹²

The key to understanding Ramsar is to realise that wetlands falling within this definition may also be placed in a smaller sub-category of special wetlands to which additional obligations apply. This important sub-division of wetlands is effectuated

¹⁰ Bowman (1995), *ibid* at 6.

¹¹ Preamble to the convention.

¹² See further section 4, *infra*, for a discussion on the applicability of this definition to coral reef habitats.

through the provisions of Article 2, which states in the first sub-section that each contracting party shall designate “*suitable wetlands within its territory for inclusion in a List of Wetlands of International Importance, hereinafter referred to as ‘the List’.*” A “suitable” wetland is one which is significant in ecological, botanical, zoological, hydrological or limnological terms.¹³

The inclusion of a site in the List is supposed to be the end result of the following systematic approach involving identification and designation. First, Ramsar has called upon contracting parties to draw up a list of all wetlands within their territories which are considered to be of international importance in accordance with the latest criteria and guidance.¹⁴ This identification process puts states in a better position to undertake the second stage of choosing which sites they will place in the Ramsar List. Designation is accordingly a unilateral act by the contracting party.¹⁵ The only imposition placed upon contracting parties with regard to listing sites is that they must designate at least one wetland when they sign, or ratify/accede to, the convention.¹⁶

The Ramsar parties have sought to ensure that the designation and listing of a wetland as internationally important be accompanied by a number of documents deposited

¹³ Article 2(2).

¹⁴ *Strategic Framework and Guidelines for the Future Development of the List of Wetlands of International Importance of the Convention on Wetlands*; latest version adopted under Resolution IX.1.

¹⁵ This is in contrast to the World Heritage Convention where qualification for the World Heritage List is subject to an independent screening process.

¹⁶ Article 2(4).

with the Ramsar Bureau. These documents include site descriptions, maps and a completed Ramsar Information Sheet.¹⁷

2.3 OBLIGATIONS RELATING TO ALL WETLANDS

Ramsar seeks to conserve wetlands through obligations applicable to all such sites, with additional obligations applying to the more ‘exclusive’ group of listed wetlands.

Thus, the following obligations apply equally to wetlands whether listed or not:

1. to promote conservation by establishing nature reserves with adequate wardening,¹⁸
2. to encourage research regarding wetlands and related flora and fauna,¹⁹
3. to promote the training of personnel competent in the fields of wetland research and management,²⁰ and
4. to co-operate with other contracting parties with respect to transboundary wetlands.²¹

In addition to the above, Article 3(1) provides that:

¹⁷ Thus, Resolution VI.16 reaffirms that the boundaries of each wetland initially listed under the obligation in Article 2(4), shall be precisely described and marked on a map “*at the time of signing the Convention without reservation as to ratification, ratifying, or acceding to the Convention*”. Subsequent listings must also be described although the timing for submitting this information is not stipulated.

¹⁸ Article 4(1).

¹⁹ Article 4(3).

²⁰ Article 4(5).

²¹ Article 5(1).

Contracting Parties shall formulate and implement their planning so as to promote the conservation of the wetlands included in the List, and as far as possible the wise use of wetlands in their territory.

The effect of this important provision has been the subject of much academic analysis in an attempt to clarify whether the standards of *conservation* for listed sites, and *wise use* for non-listed sites, amount to the same level of protection.²² Such debates are relevant given that they impact upon this study's view as to whether Article 3(1) establishes an obligation applicable to all wetlands, or alternatively a distinct obligation for those wetlands that have been listed.

In recent years it seems that attempts have been made to equate conservation with wise use. In 1987, at the Third Conference of the Contracting Parties in Regina, wise use was defined as the sustainable utilization of wetlands for the benefit of humans but compatible with maintaining the natural properties of the wetland ecosystem.²³ The definition of wise use has since been updated to reflect the developments under the 1982 Convention on Biological Diversity ("CBD") and the Brundtland Commission:

Wise use of wetlands is the maintenance of their ecological character, achieved through the implementation of ecosystem approaches, within the context of sustainable development.²⁴

If conservation of internationally important wetlands were to be accorded a different meaning, therefore, a higher standard of maintenance (perhaps more preservationist)

²² Bowman (1995), *supra* n. 9 at 10-14; Farrier and Tucker, *supra* n. 9 at 23-24.

²³ Recommendation 3.3 (Annex).

²⁴ Resolution IX.1, Annex A, para. 22.

with less human interference, would be expected.²⁵ Yet this may not accord with notable interpretations of conservation, or the general approach of Ramsar and the contracting parties.

The term “conservation” is not subject to clarification by the convention, however, as Bowman notes, the modern notions of the term are almost identical to the Ramsar interpretation of wise use. In particular, the World Conservation Strategy defined conservation as yielding the greatest sustainable benefit to present and future generations.²⁶

In addition, the contracting parties to Ramsar seem to be rejecting a preservationist interpretation of conservation, preferring instead the extension of wise use standards to listed wetlands. This tendency finds support in Ramsar’s *Strategic Framework and Guidelines for the Future Development of the List* which emphasises the continuing need for all wetlands under the convention to remain a valuable resource.²⁷ The same document goes on to note that the listing of a wetland is a first step, “*the endpoint of which is achieving the long-term wise (sustainable) use of [that site]*”.²⁸ Resolution XI.1, which contains the updated definition of wise use, states that the new provision applies, as far as possible, to all wetlands.²⁹ The wise use standard is therefore apparently being applied to listed sites as well as wetlands in general. Whilst the

²⁵ Farrier and Tucker, *supra* n. 9 at 24.

²⁶ Bowman (1995), *supra* n. 9, at 15.

²⁷ Resolution VII.11 (Annex) at para 23: “wetlands ... provide invaluable services, products and benefits enjoyed by, and sustaining, human populations. Therefore, the Convention promotes practices that will ensure that all wetlands, and especially those designated for the Ramsar List, will continue to provide these functions and values for future generations as well as for the conservation of biological diversity.”

²⁸ *Ibid.*

²⁹ *Supra* n. 24 at para 23.

obligation in Article 3(1) is absolute with respect to listed sites, but only to be pursued “so far as possible” for all others, it seems appropriate in the light of practice to regard the article as otherwise establishing a common criterion for all wetlands, regardless of listing.³⁰

One further important requirement relating to the wise use of all wetlands is the formulation of National Wetland Policies, and guidelines have been produced to enable the contracting parties to meet the challenge of putting this into practice.³¹

Accordingly, the convention’s wise use guidelines note that:

It is desirable, in the long term, that all Contracting Parties should have comprehensive national wetland policies, formulated in whatever manner is appropriate to their national institutions.³²

This is because the achievement of wise use requires awareness raising, co-ordination and planning on a national scale. The guidelines draw particular attention to impact assessment of projects upon wetlands, continuous monitoring, designating sites as internationally important, establishing nature reserves generally and the involvement of stakeholders and local people in formulating policies. The latter drive is commendable as experience in managing coral reef ecosystems has shown that such

³⁰ See further B. Phillips’ review and counter-argument to the Farrier and Tucker paper, commissioned by the Ramsar Secretary General, at www.ramsar.org/w.n.wise_use_article_response.

³¹ T. Jones, “Wise Use of Coastal Wetlands: The Approach of the Ramsar Convention” (1998) 88 *Naturopa* 11.

³² Recommendation 4.10 (Annex) at 6, and as supplemented by Resolution 5.6, in the introduction.

involvement of local communities can encourage greater co-operation and thus compliance with national initiatives.³³

2.4 OBLIGATIONS RELATING ONLY TO LISTED WETLANDS

In relation to listed wetlands, parties must comply with two significant obligations. These provisions place restrictions upon parties' freedom of dealing with wetlands and require a degree of investment in environmental monitoring, over and above the costs and constraints imposed by the generally applicable obligations noted previously.

Under Article 3(2), contracting parties must put in place mechanisms that will facilitate detection of changes in the ecological character of listed wetlands, whether likely or actual, caused by technological developments, pollution or other human interference. Such information is to be passed to the Ramsar Bureau who, with the contracting party's consent, may add the wetland to a record of such sites undergoing change.³⁴ Efforts can then be made to help the contracting party address the situation.

In addition, the removal or reduction in the size of a listed wetland by a contracting party for reasons of urgent national interest under Article 2(5) triggers an obligation under Article 4(2) to create additional nature reserves for waterfowl and to protect, either in the same area or elsewhere, an adequate portion of the original habitat, although only so "far as possible."

³³ See R.V. Salm and J.R. Clark, *Marine and Coastal Protected Areas: A Guide for Planners and Managers* (IUCN) (2000) at 65-70 and 144.

³⁴ This record has become known as the Montreux Record following its establishment at the 4th Conference of the Contracting Parties held in Montreux, pursuant to Recommendation 4.8.

2.5 OBLIGATIONS BETWEEN PARTIES

Whilst parties are asked to exchange data, research, and other publications on wetlands and their flora and fauna under Article 4(3), the principal obligation as between parties is contained in Article 5. Article 5 is divided into two themes. First, Parties should consult each other generally with respect to implementing their obligations, especially when dealing with transboundary wetlands and shared water systems. Secondly, the parties should “endeavour” to coordinate and support present and future policies and regulations.

Such obligations have been pursued through a number of initiatives including twinning arrangements between listed sites and the development of regional committees. This reflects the recognition that sharing common experiences within regions and between the same wetland types engenders cooperation and knowledge exchange.³⁵

2.6 INSTITUTIONAL STRUCTURE

It is generally recognised that, for an MEA to be in a position to tackle any given environmental concern, it is desirable that the regime’s efforts be supported by a number of institutional bodies. Over time, Ramsar has established various bodies, even if the treaty did not originally provide for them.

From the outset, the treaty, in Article 6(1), provided for the convening of Conferences of the Contracting Parties (“COP”) when deemed necessary. Such conferences were competent to address a variety of issues, including implementation, changes to the Ramsar List, changes in ecological character of listed wetlands, the commissioning of reports and the adoption of recommendations on conservation and wise use. Such a

³⁵ See further Bowman (1995), *supra* n. 9, at 26-29.

system was not considered adequate and in 1987 amendments were introduced, with Article 6(1) being reformulated to establish regular (triennial) meetings of the COP. In addition to the competences previously described, a catch-all clause was inserted providing for the adoption of resolutions or recommendations to promote the functioning of the convention.

Also from the outset, the general administration of the regime has been supported by the Ramsar Bureau, which was established under the terms of Article 8(1). The Ramsar Bureau is currently based at IUCN's headquarters in Gland, and acts as the convention's secretariat with yearly work plans defining responsibilities. The Bureau's administrative tasks currently include fostering links with other MEAs, maintaining the Ramsar List, and preparing for upcoming COPs.

Subsequent to the entry into force of Ramsar, it was recognised that the institutional provisions of the convention needed supplementing, and thus two new bodies were established. The first was a Standing Committee whose brief was to carry out such work as was called for between COPs. The committee comprises representatives from the seven Ramsar regions, as well as from the previous and upcoming host state of a COP. The committee is of particular importance given its role in steering the convention's future activities and in monitoring the activities of the Bureau.

Institutional support was further improved following the recognition by the Standing Committee that there was a need for better technical and scientific assistance. Consequently in 1993, the Scientific and Technical Review Panel ("STRP") was established, and mandated to meet annually. The STRP also comprises seven nominated experts for the Ramsar regions, six further members appointed in accordance with a desire to have balanced representation of regions and genders, and an additional expert with experience in communications, education and public

awareness. Finally, the five International Organisation Partners are also permitted one representative on the panel.³⁶ Appointments are made on a triennial basis. The panel members are required to act in an individual capacity, since contracting parties are expected to advance their views through the national focal points they can appoint specifically to liaise with the STRP.

Many have credited Ramsar's development of these institutions with helping to modernise the convention in accordance with the evolution of best practices for the administration of MEAs.

2.7 SUMMARY

In comparison to a number of more recent conventions, Ramsar contains few provisions – the original text runs to only 12 articles. Much of the detail has either been inserted through amendment or, as is more common, through the adoption of highly detailed guidance for the parties.³⁷ Further, the convention has been able to evolve over time, particularly in institutional terms.

Central to the convention are those provisions dealing with the selection and designation of sites for the Ramsar List. This system of designating and protecting defined areas has consequences regarding the obligations that are pertinent to a particular wetland. This subdivision of properties, whilst not without criticism,³⁸ is a key part of the way in which Ramsar seeks to protect wetlands. The particular

³⁶ The rules on the composition of the STRP are contained in the recently revised *modus operandi*. See Resolution IX.11 (Annex).

³⁷ The latter body of work amounts to 28 manuals and a number of resolutions and recommendations adopted at COPs.

³⁸ See Farrier & Tucker, *supra* n. 9 at 22-23.

significance of this for coral reef ecosystems will become apparent in the following section.

Having completed this brief introduction to the operation of Ramsar, and before moving on to judge the progress made by Ramsar in conserving coral reef ecosystems through MPAs since Wells' study in 1984, two further issues must first be addressed. How does Ramsar promote MPA strategies, and crucially, can coral reefs actually be dealt with as wetlands under Ramsar?

3. MPAS UNDER RAMSAR

Protected areas, both marine and terrestrial, have previously been recognised as an important element in the Ramsar system.³⁹ This, it will be argued, is established pursuant to two provisions under the convention.

The first clear example of the promotion of MPA strategies is contained in Article 4(1) which requires that:

Each Contracting Party shall promote the conservation of wetlands and waterfowl by establishing nature reserves on wetlands, whether they are included in the List or not, and provide adequately for their wardening

Progress under this obligation is easier to judge for listed rather than non-listed wetlands due to the information provided to the Bureau in relation to the former and made available through the various databases. That said, Lyster noted a number of examples of nature reserves being created on non-listed sites in some national reports submitted to the Ramsar Bureau, such as a total of 54,000 hectares spread between

³⁹ UNEP/WWF, *Conventions and Coral Reefs* (2003) at 5 available at www.unep.org.

eleven locations in Hungary and four similar sites in Iceland totalling 20,149 hectares.⁴⁰

Article 4(1) therefore highlights protected areas as an important strategy for meeting the conservation and wise use standards required for listed and non-listed wetlands. In particular, contracting parties have been reminded that of central importance to meeting this obligation will be the compilation of national wetland inventories, incorporating such areas within the management of the environment as a whole, employing different use zones within reserves where appropriate and reviewing the legal mechanisms in place in any given state for establishing and managing effectively such reserves.⁴¹ It is also a stated aim of Recommendation 4.4 that contracting parties should focus upon creating a network of nature reserves for listed and non-listed wetlands within their territory.

It can also be said that the List of Internationally Important Wetlands itself provides a further mechanism to promote protected areas. In order to make this argument, the definition of an MPA must be recalled i.e. a geographically defined area of the sea and/or shoreline which is designated or regulated and managed to achieve specific conservation objectives. Parties are required to define the boundaries of any listed wetland, within which Ramsar's generally applicable obligations, and those more stringent restrictions relating to listed wetlands, must be satisfied. Contracting parties will then need to translate this into practice and effect through implementation at the national level, thereby resulting in the listing mechanism under Article 2 having a direct influence upon a defined area of wetland, and protected area policies at state level.

⁴⁰ Lyster, *supra* n. 9 at 197.

⁴¹ Recommendations 4.4 and 5.3.

Given the need to meet Ramsar's obligations within the designated boundaries of listed sites, one approach which states can choose to adopt is to ensure that sites to be nominated for the Ramsar List are already subject to national regulation and management regimes. Thus Birnie and Boyle note that a number of sites at the time of listing are already within nature reserves although they also suggest that others become so after listing.⁴²

The convention has confirmed through guidelines that the area nominated for the Ramsar List need not enjoy protected area status prior to listing, nor is it demanded that such status be subsequently acquired.⁴³ This has led to different approaches. As Lyster claims, the UK, Chile and the Netherlands are among those states which favour only the listing of sites which are already specially protected within an enclave, relying upon the international designation to provide an added commitment to their conservation and extra recognition of their significance.⁴⁴ Alternatively, it has been argued, listing unprotected sites should be encouraged since it will generate national action to provide protection at the state level.⁴⁵

Article 2 may therefore be of limited value to calls for increasing the number of MPAs for coral reef ecosystems. To an extent, past experience bears this out since the majority of such listed sites containing coral reefs already existed within enclaves before designation, with only a few becoming protected areas afterward. However, some states do seem to take the opportunity to enlarge nature reserves when listing

⁴² Birnie and Boyle, *supra* n. 38 at 618.

⁴³ *Supra* n. 14 at para 41

⁴⁴ Lyster, *supra* n. 9 at 190.

⁴⁵ *Ibid.*

under Ramsar,⁴⁶ and the added recognition, access to funding and information, and exposure to international scrutiny of sites should enhance the effective management of these protected areas.

The Ramsar Convention therefore promotes MPAs for the conservation and wise use of marine wetlands through the provisions of Articles 2 and 4(1). The role the convention can play may be limited with respect to encouraging the creation of new MPAs, however its significance lies more in promoting better management and thus tackling the problems of paper parks. This comes about through the exposure of listed sites to the involvement and scrutiny of the international community, whether through national reporting or the Montreux Record mechanism. In addition, the obligations imposed under Ramsar may increase the level of protection which would otherwise have been provided under national provisions. Further, international recognition can help countries to promote and market wetlands to visitors, and help government departments charged with environmental affairs to secure the integrity of a site within national policy development. In all of these ways, the management of MPAs for marine wetlands can be potentially strengthened under Ramsar.

In order to say that this promotion of MPAs has a bearing upon coral reef ecosystems, this study must satisfy itself that these habitats fall within the convention's definition of a wetland.

⁴⁶ On the basis of figures given to Ramsar and the records of the World Database on Protected Areas (www.sea.unep-wcmc.org/wdbpa), France, Thailand and Iran seem to have enlarged pre-existing reserves when listing sites containing coral reefs.

4. LEGAL COMPETENCE UNDER RAMSAR

The convention's definition of a wetland was briefly discussed in the previous section. Referring back to Article 1(1),⁴⁷ a number of additional matters should be noted. First, individual wetlands are defined by reference to geomorphological areas sharing a common natural element - water. This was noted to an extent by Geoffrey Matthews:

All wetlands have one feature in common. They are based on a substrate that is at least occasionally covered or saturated with water.⁴⁸

This is further reflected in the system of wetland classification adopted for the Convention which contains reference to such geomorphological areas as estuaries, karst systems, rocky shores, rivers and deltas.⁴⁹ As noted earlier, the protection of these areas is important as they can act as habitats supporting characteristic flora and fauna.⁵⁰

Secondly, it is clear that the remit of the convention is extremely wide. Over time this definition has accordingly allowed Ramsar to address the broad range of wetlands listed in the classification system, to the extent that it is worth recalling the light-hearted comment of IUCN's former Director General when in 1990 he said:

⁴⁷ *"For the purposes of this Convention wetlands are areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres."*

⁴⁸ G. V. T. Matthews, *The Ramsar Convention on Wetlands: Its History & Development* (Ramsar Convention Bureau) (1993) at 42-43.

⁴⁹ Recommendation 4.7

⁵⁰ *Supra* n. 11. Wetlands are therefore not defined in terms of the spatial range of an ecosystem.

only two Conventions are really needed to cover the conservation of all habitats in the world – the Ramsar Convention dealing with any land that can generally be termed ‘wet’, and a Drylands Convention dealing with anything else.⁵¹

However, it is not entirely clear that the definition of “wetland” under the Ramsar Convention is wide enough to offer sufficient coverage for all coral reefs. To understand this concern, a brief recap on marine biology and the formation of coral reefs is needed.

Corals occur widely throughout marine waters, yet reef building by warm water corals through the deposit of calcium carbonate is limited by factors such as temperature, light levels, depth, sedimentation, salinity and exposure to the air.⁵² The availability of light is of paramount importance to the development of coral reefs. As has been mentioned earlier, individual warm water corals are host to small plants called zooxanthellae which, through photosynthesis, provide them with their main source of energy for the energetically demanding process of calcification.⁵³ Insufficient light has the effect of reducing energy supply and accordingly inhibits the ability of corals to secrete calcium carbonate and thus build reefs. Given that light decreases with depth, reef formation is correspondingly limited. Reef building undertaken by corals therefore flourishes in water depths of less than 25 metres,⁵⁴ and

⁵¹ Quoted in Bowman (1995), *supra* n. 9 at 8.

⁵² For a detailed explanation of these limiting factors see Chapter 2 and in general J.W. Nybakken, *Marine Biology* (Benjamin Cummings) (2001, 5th Ed.) at 372-373.

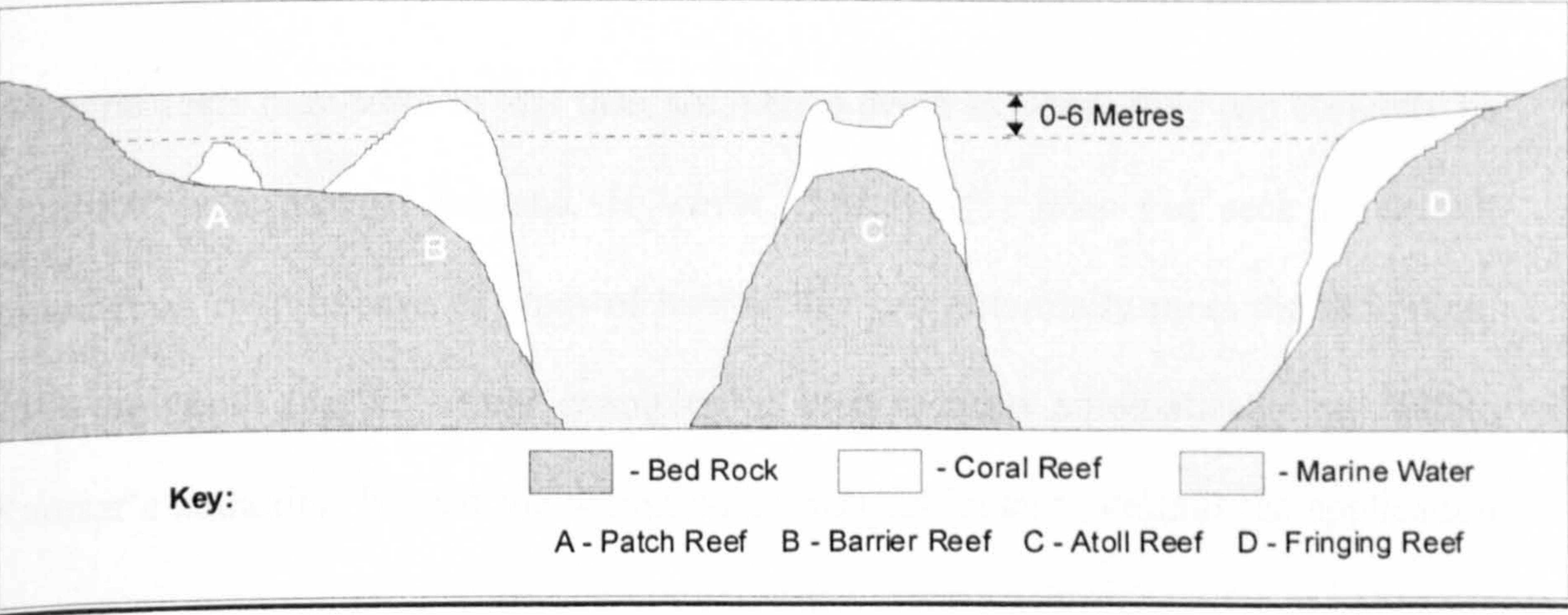
⁵³ O. Hoegh-Guldberg, “Climate change, coral bleaching and the future of the world’s coral reefs” (1999) 50 *Marine Freshwater Research* 839 at 859.

⁵⁴ Nybakken, *supra* n. 52 at 372. Reduction in the intensity of light by sedimentation in the water (turbidity) will bring the limits of such reef building even closer to the surface.

ceases altogether between 50-100 metres depending upon conditions.⁵⁵ In order to complete the picture, upward reef formation is ultimately limited by exposure to air and therefore relates to the level of low tides.

Diagram 5 indicates the main types of coral reef formation consequent to this process, these being Fringing Reefs, Barrier Reefs, Atoll Reefs and Patch Reefs formed within the lagoons that result from Atoll and Barrier Reefs. As will be recalled, Atolls arise in relation to volcanic activity which sees an island initially created (around which a collar of Fringing Reef forms), but which then subsides back into the ocean. Where upward coral growth is faster than the speed of descent as the island subsides, a ring shaped atoll will be formed.⁵⁶

Diagram 5 – Types of Reef Formations



As the dotted line in Diagram 5 indicates, in relation to almost all Atoll (C), Fringing (D) and Barrier Reefs (B), the physical substrate of a reef will develop both above and below the six metre depth limit stipulated for wetlands falling within the convention’s jurisdiction. It is also possible for no part of a coral reef to form within the 0-6 metre limit. The isolated dive site of “Magic Mountain” off the coast of

⁵⁵ M. D. Spalding *et. al.*, *World Atlas of Coral Reefs* (University of California) (2001) at 26.

⁵⁶ See Diagram 3 for more detail.

Sumba island in Indonesia is a submerged sea mount of coral reefs (not indicated in the diagram) which, at its shallowest, comes within 8-10 metres of the surface, but whose reef slopes drop away to depths in excess of 60 metres.⁵⁷ Further, Patch Reefs (A), which form on lagoon floors, may or may not develop to a height within the 0-6 metre limit.⁵⁸

Given the above, a potentially significant problem with the way in which Article 1(1) has been drafted can be identified. The limits of the geomorphological area used to define wetlands under the convention – unambiguous limits which in the absence of specific revision or amendment it is problematic to suggest should simply be ignored⁵⁹ - excludes all but the upper portion of the reef structure for the vast majority of coral reefs and maybe even excludes entire reefs in more exceptional circumstances.

As coral reefs may form in less than six metres depth of water they can correctly be regarded as a type of wetland. However, Article 1(1) does not seek to delimit jurisdiction by reference to types of habitat that can potentially meet the definition, with the result that all actual examples of such habitats automatically fall within Ramsar's authority. Instead the definition of wetland looks to delimit the application

⁵⁷ For a description and plan of the site, see K. Muller, *Underwater Indonesia: A Guide to the World's Greatest Diving* (PeriPlus Editions) (1995) at 160-161.

⁵⁸ Other examples of reef formations which may not develop into the 0-6 metre depth limit under Article 1(1) include the rare Thila reefs of the Maldives, such as Kadu Rah Thila on Ari Atoll which lies between 13-30m deep.

⁵⁹ The principle of effectiveness and the requirement that treaties be interpreted in good faith precludes interpretations that deny giving any meaning or effect to terms of a convention. See G. Fitzmaurice, "The Law and Procedure of the International Court of Justice 1951-4: Treaty Interpretation and Other Treaty Points" (1957) 33 *B.Y.I.L.* 203 at 211; Lord McNair, *The Law of Treaties* (Clarendon Press) (1961) at 383-385.

of the convention on a site by site basis, so that each particular site must meet the definition. Therefore, from this perspective, what is the position for structural elements below the depth limit or the 'Magic Mountain' scenario where no part of the reef structure lies within the upper six metres of the marine water? If the zones below this limit are not within the jurisdiction of the convention, then vast areas may justifiably be regarded as exempt from the obligations under Ramsar. This presents governments with an arguable case for failing to pursue a comprehensive policy for protecting coral reefs under the convention.

In practice, however, and as will be seen in the following sections of this article, the inclusion of entire coral reef ecosystems has not proved contentious and, more importantly, is often demanded. Further, references to coral reefs in Ramsar documents do not contain a qualification as being applicable only to those parts of coral reefs lying within a depth of six metres. This situation, where coral reefs are being dealt with without noticeable objection, suggests that there must be a favourable way of interpreting or applying the convention so as to extend the operation of the convention into waters deeper than six metres. This thesis will explore a number of ways of doing this.

4.1 INCREASING THE DEPTH LIMIT BY REFERENCE TO ARTICLE 2(1)

According to Sir Gerald Fitzmaurice's formulation of the major principles of interpretation, and as supported in Article 31(1) of the Vienna Convention on the Law of Treaties:⁶⁰

⁶⁰ 1155 U.N.T.S. 331. "*A treaty shall be interpreted in good faith in accordance with the ordinary meaning to be given to the terms of the treaty in their context and in the light of its object and purpose*" [Emphasis added]. Whilst the provisions of the Vienna Convention are not retroactive and therefore do not apply to conventions concluded before its entry into force (i.e. those concluded pre-1980, such as

Treaties are to be interpreted as a whole, and particular parts, chapters or sections also as a whole.⁶¹

This may seem like common sense, meaning that Article 1(1) should not be interpreted in isolation, but also in the light of the rest of the convention's provisions as part of the context in which the definition lies.

Such wider reflection initially highlights Article 2(1) – an article that has been described as effectively extending the wetlands definition.⁶² The terms of this provision state that the boundaries of each listed wetland:

may incorporate riparian and coastal zones adjacent to the wetlands, and islands or bodies of marine water deeper than six metres at low tide lying within the wetlands...

Does this article therefore extend the limits of the wetland definition into waters deeper than six metres? Unfortunately, only to a limited extent for the following reasons.

First, the provision applies only to the smaller category of internationally important wetlands included on the Ramsar List, negating any relevance of a possible extension to all coral reefs. Second, the article simply refers to acceptable boundaries for

Ramsar), the provisions on interpretation have been said to reflect customary law. See M. Fitzmaurice, "The Practical Working of the Law of Treaties" in M. D. Evans, *International Law* (OUP) (2003) at 186.

⁶¹ G. Fitzmaurice, *supra* n. 59 at 211 (Principle of Integration). That this reflects common sense was emphasised by Sinclair when he wrote "*The text of a treaty must of course be read as a whole. One cannot simply concentrate on a paragraph, an article, a section or a part.*" I. Sinclair, *The Vienna Convention on the Law of Treaties* (Manchester University Press) (1984, 2nd Ed.) at 127.

⁶² Bowman (1995), *supra* n. 9 at 8.

reserves, rather than changing the actual definition of wetlands.⁶³ As mentioned earlier, in designating an internationally important coral reef, a map indicating the boundaries of the site must be submitted.⁶⁴ Those boundaries need not be determined in accordance with the limitations provided for in the wetlands definition in Article 1(1).⁶⁵

The consequences of this are that, in practice, the whole area within the boundary will be subject to both the generally applicable and particular obligations for listed wetlands, as described earlier. In this sense, it could be said that the definition of listed wetlands has been effectively, albeit not formally, enlarged. This interpretation also maintains a unified definition of wetland rather than postulating a wider definition for the smaller sub-category of listed wetlands, which would pose logical difficulties.

If this provision is applied to the various reef formations as represented in Diagram 5, the final limitation to Article 2(1) can be identified. The *Guidance for Identifying and Designating Peatlands, Wet Grasslands, Mangroves and Coral Reefs as Wetlands of International Importance* claims that:

In determining the boundaries of a coral reef site to be designated, Contracting Parties should take into account Article 2(1) of the Convention. Since the outer parts of many coral reef systems... and the

⁶³ Article 2(1): “The boundaries of each wetland shall be precisely described and also delimited on a map...”

⁶⁴ *Supra* n. 17.

⁶⁵ The reasoning behind this may be that in pursuing such a protected area strategy, conservation aims may require boundaries to be set in relation to other factors that help to maintain the values that have made the coral reef internationally important.

middle of some lagoon systems extend to below six metres water depth,

boundaries of coral reef sites should include all such parts of the reef.⁶⁶

Whilst this statement recognises the problem already identified with Article 1(1) and advocates the authority of Article 2(1) to allow boundaries to be drawn free from the constraints under the wetland definition, the argument fails to recognise that Article 2(1) contains its own restrictions on the drawing of boundaries. This is because the terms of the article state that the boundaries may only incorporate “coastal zones” adjacent to the reefs or deeper areas of marine water “lying within the wetlands.”

The latter wording appears to suggest that these deeper areas must, to some unspecified degree, be enclosed by areas that do conform to the wetland definition. This might therefore enable the inclusion of Patch Reefs enclosed within Atoll or Barrier Reef lagoons (as suggested in the passage quoted), and perhaps landward facing Atoll and some Barrier Reef slopes.⁶⁷ However, the issue remains that seaward-facing slopes on these latter reefs, submerged seamounts, and Fringing Reefs could not be incorporated within boundaries on the basis of this wording.

Further, the fact that Article 2(1) allows coastal areas to be incorporated, may not offer sufficient latitude for resolving this issue either, on the basis that the coast is simply the area of land which borders the sea. On that basis, boundaries could not be drawn in a seaward direction.

It is submitted that, on this interpretation, Article 2(1) is of limited use for extending the definition of wetlands to encompass all coral reefs and therefore justifying current

⁶⁶ *Guidance for Identifying and Designating Peatlands, Wet Grasslands, Mangroves and Coral Reefs as Wetlands of International Importance*, para 74 as annexed to Resolution VIII.11.

⁶⁷ Where the barrier reef lies at some distance from the land, this may stretch the notion of “enclosed” too far.

practice. This article has not formally changed the definition of wetlands under Ramsar but instead allows boundaries of listed wetlands to be drawn free from the constraints of Article 1(1). In practice this has the effect of applying the convention's obligations to the entire area within these boundaries. The difficulty is that whilst the boundaries may be drawn free from the limitations of Article 1(1), Article 2(1) applies its own constraints. It is submitted, therefore, that this article should not be relied upon as justification for Ramsar's jurisdiction over all areas of coral reefs.

4.2. EXTENDING THE DEFINITION OF WETLANDS BASED UPON THE CONSERVATION AND WISE USE OBLIGATIONS

The second possible basis can be established by giving further consideration to the context within which Article 1(1) operates and in particular the effects of Article 3(1). As has been noted, this particular provision obliges contracting parties to promote the conservation of listed wetlands and, as far as possible, use unlisted wetlands wisely.

The obligations expressed in Article 3(1) have needed further elaboration particularly with respect to the contracting parties being reminded of the importance of implementing management measures that also operate in areas beyond the limits of Ramsar wetlands. To this end, guidelines have been produced to prompt contracting parties to include river basins within management plans and to formulate policies of integrated coastal zone management.⁶⁸

Coral reef ecosystems function as a complex ecological unit, with numerous inter-relationships between species, which in turn can impact upon the ability of corals to

⁶⁸ Resolution VII.18 (*Guidelines for Integrating Wetland Conservation and Wise Use into River Basin Management* (1999)); Resolution VIII.4 (*Principles and Guidelines for Incorporating Wetland Issues into Integrated Coastal Zone Management* (2002)).

maintain reef building.⁶⁹ They also function within the context of linked habitats, such as adjacent reefs and mangroves that act as nurseries for juvenile reef fish. The need for wider management planning is therefore of particular relevance to coral reefs.

Consequently, to fail to include in management plans or within park boundaries, areas of coral reefs (whether listed or unlisted) occurring at depths greater than six metres would contravene these guidelines and seriously undermine a contracting party's ability to meet the conservation and wise use standards under Article 3(1). It is therefore suggested that, subject to the following proviso, such reasoning could be submitted as a counter-argument to governments who fail, through reliance on the strict interpretation of Article 1(1), to pursue a comprehensive policy for protecting coral reefs under Ramsar.

The one proviso to this line of reasoning is that it hinges upon at least some part of a given coral reef meeting the Article 1(1) definition. It does not justify extending the jurisdiction of the convention for those limited situations where no part of the reef structure lies between the surface and a depth of six metres. The limitation is therefore likely to affect only isolated submerged reefs like the 'Magic Mountain' site off the coast of Sumba – Patch Reefs often being ecologically linked to the Barrier and Atoll Reefs which enclose them.

Article 3(1) offers far greater scope for demanding the inclusion of all areas of coral reefs, although again, not through changing the underlying definition of wetland. In

⁶⁹ There have been a number of documented examples where removal of key species, usually through over-fishing, have changed the balance within coral reef ecosystems so as to inhibit the ability of corals to maintain reef building. See for example reports on the state of the Jamaican coral reefs in Nybakken, *supra* n. 52 at 415.

this instance this has been achieved by reference to the demands placed upon the contracting parties to meet the convention's conservation and wise use objectives. This approach therefore offers another effective extension of the Article 1(1) definition, although significantly in this case for both listed and unlisted wetlands. Ultimately though, this reasoning falls just short of giving jurisdiction to Ramsar over all areas for all coral reefs.

4.3 STATE PRACTICE

Another possible explanation for the apparent extension of the limits of the wetland definition into waters deeper than six metres may exist independently of those discussed above and which would apply to all coral reefs without exception. Recalling the Vienna Convention on the Law of Treaties and its articles concerning interpretation, the context for any given term is said to include any subsequent agreement between all of the parties to a treaty regarding interpretation or application. Such agreement may be established through subsequent practice.⁷⁰

Fitzmaurice described the nature of this principle:

what is here in question is not so much the meaning of an existing text, as a *revision* of it, but a revision brought about by practice or conduct, rather than effected by and recorded in writing.⁷¹

Fitzmaurice submitted that it is the duty of courts or tribunals to then interpret treaties in their revised form. Such agreed interpretation can therefore be used, not just to clarify a term, but also, in effect, to result in its amendment.

⁷⁰ Vienna Convention on the Law of Treaties, Article 31(3).

⁷¹ G. Fitzmaurice, *supra* n. 59 at 225.

Examples from the charter airline industry and the handling of vetoes in the UN Security Council when passing non-procedural matters, have been cited in support of this practice.⁷² State practice under Ramsar may therefore be another example of this, with the contracting parties having simply agreed to depart from the strict wording of the text to reflect a common understanding and desire. Such *bona fide* concerns would have developed later in time as the perception of the convention's application to waterfowl became more tempered and coral reef conservation issues became more widely understood and promoted.

Of significance in forming a view on this is Aust's suggestion that:

It is not necessary to show that each party has engaged in a practice, only that all have accepted it, albeit tacitly. But, if a clear difference of opinion between the parties exists, the practice may not be relied upon as a supplementary means of interpretation.⁷³

With many coral related resolutions adopted at meetings of the contracting parties,⁷⁴ and the opportunity arising in the same forum for expressing opposition to the unilateral inclusion of coral reef sites, it would be difficult to suggest that the parties had not tacitly agreed to the practice of extending the wetlands definition beyond the six metre limit so as to include these ecosystems. If this interpretation is correct, then all coral reef structures, whether listed or not, can be regarded as wetlands under Ramsar, in contrast to the previous grounds which have been examined.

⁷² See A. Aust, *Modern Treaty Law & Practice* (CUP) (2000) at 194-195 for these and other examples.

⁷³ *Ibid* at 195.

⁷⁴ For details of coral reef related resolutions, see later discussion, *infra* at 249.

4.4 SUMMARY

At times when it has been necessary to define wetlands in Ramsar documents, the tendency has been to refer to both Articles 1(1) and 2(1), but to omit reference to the limitation of Article 2(1) to listed wetlands. Accordingly, the Ramsar *Guidelines on Developing and Implementing National Wetland Policies*, when seeking to help contracting parties to define wetlands, simply suggests that Article 1(1) is extended by Article 2(1).⁷⁵

In other documents that specifically deal with coral reef ecosystems under Ramsar (which will be discussed in later sections), there seems to be a noticeable focus in these documents upon designating sites for the Ramsar List of Wetlands of International Importance. When discussing such issues, Article 2(1)'s effective extension of the convention's definition of wetlands may at first sight appear to solve problems of applicability to those coral reefs – although as has been shown this provision contains significant limitations in this context.⁷⁶

On those rare occasions when wise use of non-listed wetlands with coral reef ecosystems is specifically addressed, this study has found either a reversion to the aforementioned Guidelines' gloss on Articles 1(1) and 2(1),⁷⁷ or simply no mention at all.⁷⁸

For two reasons, this approach might suggest an unnecessary self-consciousness about the issue on the part of the regime. First, current state practice appears to favour

⁷⁵ *Guidelines on Developing and Implementing National Wetland Policies* at section 2.4. Guidelines adopted under Resolution VII.6 (Annex).

⁷⁶ This was the case in Wells' study, which focused upon listed wetlands (*supra* n. 8).

⁷⁷ D. Peck, *Coral Reefs & the Ramsar Convention* (1995) available at www.ramsar.org.

⁷⁸ Recommendation 6.7.

a wider application of the convention to conserve all areas of coral reefs, whether listed or not. This may in itself be grounds for concluding that the scope of Article 1(1) has been revised. Second, and alternatively, an effective intention to expand its scope can be discerned in the convention's conservation obligations. This latter reasoning has merits and disadvantages when compared to the 'revision-through-state-practice' argument. In its favour, reasoning based upon the conservation obligations benefits from a foundation in the text of the treaty. However, such arguments are comparatively weaker in that they will not apply to all coral reefs, i.e. those (albeit rare) instances where no part of the reef structure lies between the surface and a depth of six metres. Nevertheless, two possible grounds can be advanced for justifying Ramsar's jurisdiction over all, or large, areas of coral reef. This may in turn explain current State practice.

In the light of this conclusion this thesis can now turn to updating Wells' study and judging the convention's ability and success in tackling the problems faced by these ecosystems. Questions of membership, implementation by contracting parties and promoting greater action within the regime are central to this issue.

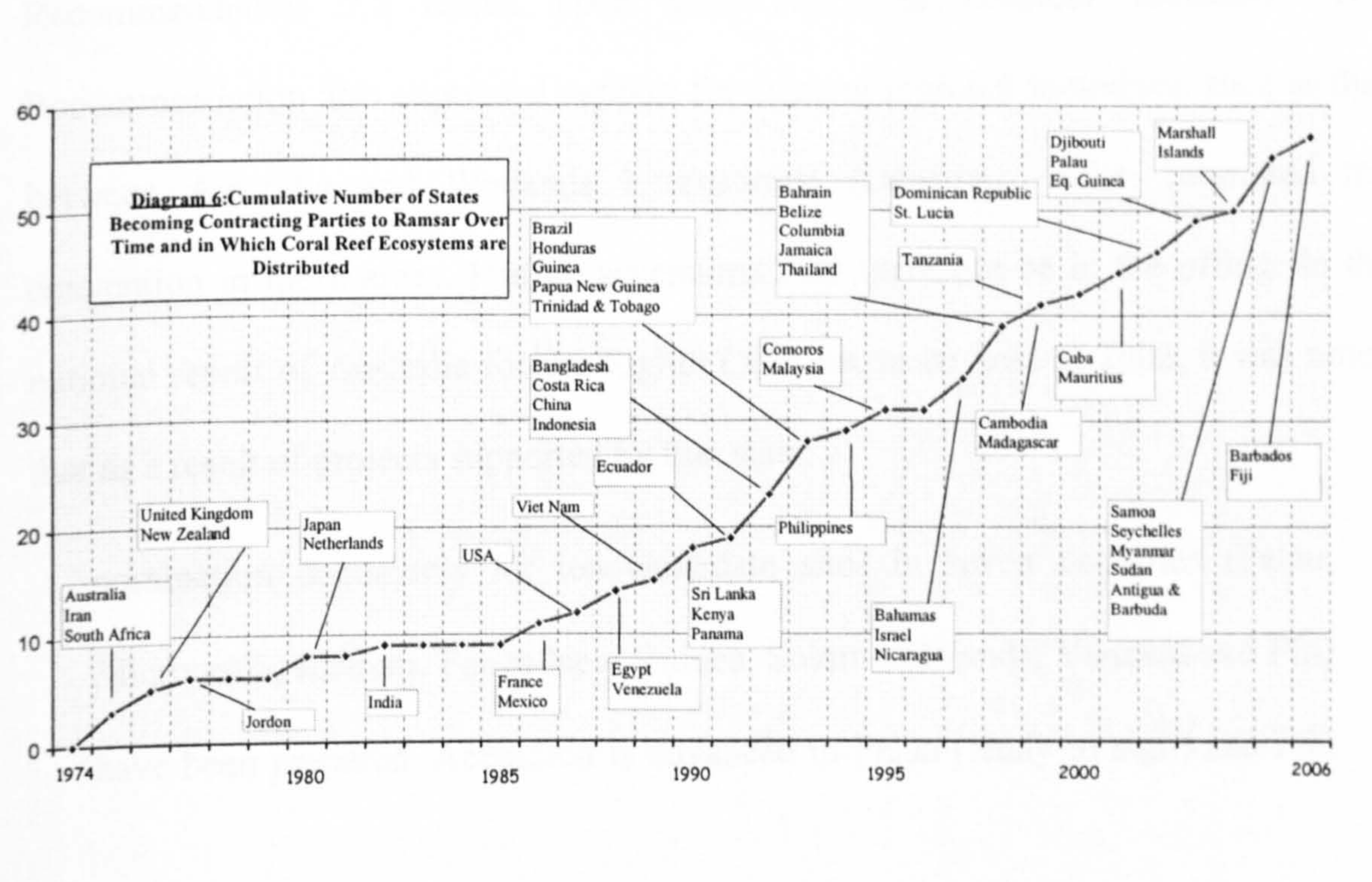
5. GEOGRAPHICAL COVERAGE THROUGH MEMBERSHIP OF STATES

In September 2001, the United Nations Environment Programme, together with the World Conservation Monitoring Centre, published the *World Atlas of Coral Reefs*.⁷⁹ In the process of creating the atlas, it became apparent that coral reefs occupied a far smaller area of the planet than had previously been thought. Coral reefs were found to be distributed in 80 states. Of these states (and three others which were overlooked), to date 57 are contracting parties to Ramsar. The identities of these states are given in

⁷⁹ Spalding, *supra* n. 55.

Appendix I. Diagram 6 identifies these countries, the year in which they joined and the cumulative total number of states. This compares favourably to Wells’ total of nine states in 1984. In addition, it can be noted that over 83% of the global distribution of coral reefs is covered by the provisions of the convention. From such data it is possible to appreciate the current geographical coverage of Ramsar.

Increasing the number of contracting parties has often been an issue for Ramsar from the outset. For example, at the very first Wetlands Conference in Cagliari, it was apparent that the then 28 contracting parties were mainly situated in the western Palaearctic region, particularly in Europe. The very first recommendation under Ramsar therefore called for efforts to be made to increase the number of contracting parties in the Western Hemisphere and in the Tropics.⁸⁰



Wells noted that, in 1984, many important coral reefs were in countries that were not yet contracting parties,⁸¹ whilst Dwight Peck felt that the position remained largely

⁸⁰ Recommendation 1.1, *On Expanding the Convention’s Membership*.

⁸¹ Wells, *supra* n. 8 at 57.

true at the time of writing in 1995.⁸² Therefore, the current figure of 57 states representing at least 83% coverage of global coral reef habitat is particularly encouraging, even though this compares unfavourably to 98.35% under the CBD.⁸³ Therefore, there remains a compelling need to enlarge the membership of Ramsar in order to increase the coverage of the convention's provisions for coral reefs around the world.

Targeting particular states should pay dividends in this respect. The first general objective of the 1997-2002 Strategic Plan for Ramsar noted that there was a particular need to encourage Small Island Developing States to become contracting parties,⁸⁴ partly because coral reefs fall within their jurisdiction and are considered significant wetlands upon which local populations are particularly dependent. In 1999, Recommendation 7.2 called upon such states to consider accession. The Recommendation also expressed support for existing regional initiatives, such as that between Australia and Wetlands International (Oceania), which promoted the convention in these areas. Further accessions may therefore be in the offing. In the national report of Australia for the Eighth COP due to be held in 2002, it was noted that as a result of projects supported by that state:

nomination documents for ten candidate sites in seven countries (Palau, Micronesia, Kiribati, Papua New Guinea, Solomon Islands, Vanuatu and Fiji) have been prepared. Accession is advanced in Palau (ready to sign) and Fiji,

⁸² Peck, *supra* n.77.

⁸³ Coverage under the World Heritage Convention is 97.34% although this bald figure does not take account of the fact that the convention only applies to a select number of these reefs.

⁸⁴ This grouping includes such nations as the Maldives, Palau, Federated States of Micronesia and many Caribbean countries. For further information see www.sidsnet.org.

and serious interest in accession has been generated in Vanuatu and the Solomon Islands.⁸⁵

Whilst Papua New Guinea was already a contracting party at the time, and Palau and Fiji have acceded since the report was completed, the remaining states have yet to join. Consequently it is important for the remaining Pacific Island Nations showing an interest in joining to progress towards membership. It is worth noting that gaining the membership of Federated States of Micronesia, Kiribati, Solomon Islands and Vanuatu alone would bring an additional 6.03% of global coral reefs within Ramsar's remit.

It is therefore apparent that current participation of relevant states in Ramsar places the convention in a strong position to deal with the threats faced by coral reef ecosystems. This is a significant improvement from 1984. There is, of course, a need to continue the policy of targeting states outside of the Pacific and Caribbean, such as the Maldives and Saudi Arabia, whilst continuing to support the existing regional initiatives that are proving to offer great hope for increasing the coverage of the convention in coral reef areas.

6. PROMOTING ACTION BY CONTRACTING PARTIES

This study has demonstrated how coral reefs can justifiably be dealt with under the Ramsar regime, and how strong the convention is with regard to its geographical coverage of coral reef ecosystems. In this section, the promotion of coral reef ecosystem conservation will be explored. The following section will then update Wells' study by analysing how many coral reef sites find protection as listed wetlands of international importance, against the backdrop of such promotion.

⁸⁵ National Report of Australia to COP 8, November 18-26, 2002, para 1.1.1.

As will be seen later, contracting parties to the convention have included sites containing coral reefs in the Ramsar List since 1974. In these early years, Australia, South Africa, Venezuela, and the Netherlands clearly felt that the convention could afford protection to such wetlands, albeit as one particular type amongst others within a designated site. However, it was not until 1990 that the contracting parties collectively stated that the convention was intended to include coral reef ecosystems. The history behind this decision was as follows.

The Second COP, held in Groningen in 1984, established a number of priority points for action. At that time, the parties recognised the need to produce a classification system for wetland types, as well as a standardised datasheet on wetlands.⁸⁶ These two initiatives were subsequently developed and implemented in 1990 at the Montreux conference pursuant to Recommendation 4.7 and now form the basis of the Wetlands Database maintained by Wetlands International.⁸⁷ Significantly, Annex IIB to that recommendation, which sets out the system of wetland classification, specifically states that coral reefs are regarded as a type of wetland for the purposes of the convention.⁸⁸

Coral reef ecosystems were next directly addressed when, in 1995, the Bureau produced a short paper entitled *Coral Reefs and the Ramsar Convention*.⁸⁹ The paper noted the earlier inclusion of coral reefs in the wetland classification system, as well as implicitly supporting Wells' view that there was a need for a multilateral

⁸⁶ Recommendation 2.3.

⁸⁷ In fact perhaps one of the earliest references to coral reefs in a Ramsar document can be found in the commissioned report of D.A. Scott, *Design of Wetland Data Sheet & Wetland Typology* January 1989, which helped shape Recommendation 4.7.

⁸⁸ Recommendation 4.7, Annex IIB, *Marine and Coastal Wetlands*, No. 3.

⁸⁹ Peck, *supra* n. 77.

instrument to recognise the importance of coral reefs and that Ramsar could be the appropriate forum for coral reef conservation. The paper goes on to note, *inter alia*, that the standard of wise use is particularly suitable to the management of coral reefs as it draws upon the involvement of local communities, catchment-wide planning and sustainable development. In return, listing of a coral reef under the convention offers publicity and prestige to the site, access to multilateral information resources on wetlands, and small-scale funding support. The paper concludes by stressing that in order to tackle the threats faced by coral reef ecosystems, a framework mechanism to aid international communication, avoid duplication of efforts, maintain awareness and to act as a focal point for developers and funding sources is needed. It goes on to state that to this end:

the Ramsar Convention and secretariat have developed a body of such experience and contacts over many years and would be glad to assist in any way possible.⁹⁰

Since 1995, the Bureau has proceeded on two fronts. First, steps have been taken to promote the conservation of coral reefs by contracting parties. Second, and as discussed later in section 7, efforts have been made to position the convention at the forefront of multilateral regimes charged with conserving coral reefs.

In relation to internal promotion, since 1996 and the Sixth COP held in Brisbane, there have been a number of notable recommendations and resolutions adopted by the parties. Many have been linked to efforts to increase membership of Small Island Developing States for whom coral reef ecosystems are vitally important.⁹¹ Further,

⁹⁰*Ibid.*

⁹¹ See Recommendations 6.18 and 7.2, as well as Resolution VIII.42.

Recommendation 6.7 (Conservation of Coral Reefs) urged contracting parties to designate suitable areas of coral reefs for inclusion in the list as well as recommending that the Bureau fully embrace conservation and wise use of coral reefs as part of its worldwide wetland conservation strategy.

Significantly, in 2002, detailed guidelines were adopted by the contracting parties for identifying and designating coral reefs for the list, as under-represented wetland types.⁹² In particular, the guidelines call upon States to consider reefs which, *inter alia*, act as coastal protection, are threatened by degradation, are important for the richness of fish species, and/or are of particular aesthetic, historic or scientific interest. With an emphasis placed upon an holistic approach to designation where coral reefs and associated systems such as mangroves are included in a site, as well as the need to network sites and designate areas which act as centres for coral breeding and dispersal, the guidelines reflect current thinking on conservation strategies. The strength of the convention should therefore be recognised and commended.⁹³

Whilst it is difficult to draw firm conclusions as to how successful this internal promotion has been with respect to the promotion of coral reef conservation through MPA strategies in general, data drawn from the Ramsar List might shed some light.

⁹² Resolution VIII. 11 (Annex).

⁹³ Ramsar has also recently created pages within its website dedicated to the issue of conserving coral reefs under the convention.

7. LISTING OF CORAL REEF ECOSYSTEMS AS WETLANDS OF INTERNATIONAL IMPORTANCE

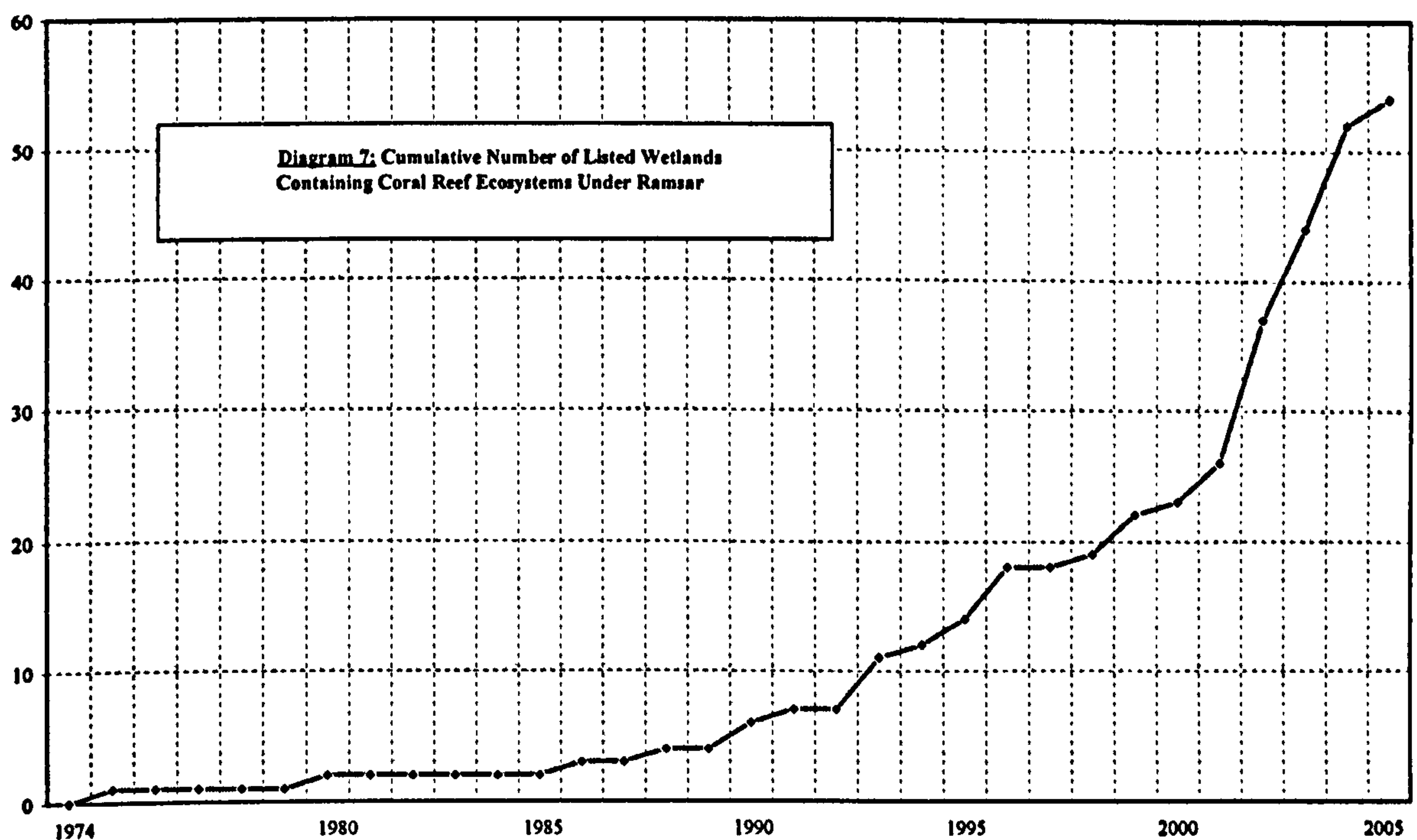
Wells recognised that designation of coral reefs under Ramsar was poor.⁹⁴ To what extent have matters improved over the last 20 years? Judging such progress is now aided by the requirement that contracting parties must complete information sheets for each listed site. The information sheet requires codes to be entered, as established by the system of wetland classification, corresponding to those types of wetlands present in a listed site. The contracting party is also requested to list wetland types in order of dominance. The data collected from these returns has been compiled by Wetlands International.⁹⁵

Diagram 7 represents the cumulative number of listed wetlands in which coral reef ecosystems are represented.⁹⁶ Whilst it can be seen that coral reefs have been represented in the Ramsar List since its creation (Australia's first designated site in 1975, the Cobourg Peninsula, hosts Fringing Reefs), from the 1990's onwards the number of designated sites containing coral reefs has increased significantly to a total of 54 to date.

⁹⁴ Wells, *supra* n. 8 at 57.

⁹⁵ Available at www.wetlands.org.

⁹⁶ Based upon the data held by Wetlands International and updated by the author from site descriptions and recent designations from the end of 2004 and the beginning of 2005 which have, as yet, not been fully entered into the Wetlands International database. The author's figures match those of the Ramsar Bureau presented at www.ramsar.org/types_coral_present.pdf. The author, however, expects that the current figure might be 55 sites on the basis of general descriptions available on the Savannes Bay site designated by St Lucia in 2002. Wetland information sheets on this site have yet to be submitted.



Problems arise in linking designations to Ramsar promotional activities. Further, and with few exceptions, difficulties also apply to establishing that countries are motivated to designate sites because of the presence of coral reefs. Fortunately, contracting parties do indicate the dominance – although not the precise area - of a given habitat in the information sheets for the sites they designate, in addition to providing a detailed description of the habitats within a site. Whilst dominance does not indicate which wetland type has motivated any given listing, it is useful to note that coral reefs are a dominant wetland type at 16 sites.⁹⁷

⁹⁷ (1) Cobourg Peninsula, Australia [1975], (2) Kleine Bonaire, Netherlands Antilles [1980], (3) Moreton Bay, Australia [1993], (4) Grand Cul-de-Sac, Guadeloupe [1993], (5) Pulu Keeling National Park, Australia [1996], (6) Archipelago Los Roques, Venezuela [1996], (7) Tubbataha Reefs National Marine Park, Philippines [1999], (8) Sheedvar Island, Iran [1999], (9) Parque Estadual Marinho do Parcel Manoel Luis, Brazil [2000], (10) Diego Garcia, United Kingdom [2001], and arguably from the site descriptions provided to date, (11) Ashmore Reef, Australia [2002], (12) Coral Sea Reserves, Australia [2002], (13) Elizabeth and Middleton Reefs, Australia [2002], (14) Savannes Bay, St Lucia [2002], (15) Ciénaga de Lanier y Sur de la Isla de la Juventud, Cuba [2002], (15) Haramous-Loyada, Djibouti [2003].

That figure may be on the conservative side. First, some contracting parties, e.g. the Philippines and Thailand, choose to specify a single dominant wetland type in their information sheets, in comparison to others who specify a number. Second, recent designations by Equatorial Guinea, the Marshall Islands, and Mexico have yet to be processed by Wetlands International and early indications suggest that nine of these new sites may include coral reefs as a dominant wetland type.⁹⁸

Putting such details aside, Diagram 7 indicates that there has been an increase in designation of coral reef sites since the middle of the 1990's, and, whilst a direct link cannot be conclusively made, this does at least coincide with the convention's new focus upon, and internal promotion of, coral reef ecosystems from 1995 onwards. Further, whatever the cause, Ramsar is generating a response from contracting parties with the potential for helping coral reefs.

Clearly, however, coral reef wetlands must still be regarded as an under-represented type under Ramsar considering that a total of 1,611 sites have been listed to date. Many states in which coral reefs are found may be parties to the convention, yet only a few have included coral reefs within designated sites. Further, many have already recognised the significance of some reefs through the designation of MPAs at the national level without also listing such sites under Ramsar, such as the Ras Mohammed National Park in Egypt,⁹⁹ or the Florida Keys National Marine Sanctuary

⁹⁸ These sites are Cuencay y Corales de la Zona Costera de Huatulco [2003], Parque Nacional Arrecifes de Xcalak [2003], Parque Nacional Isla Contoy [2003], Parque Nacional Isla Isabel [2003], Parque Nacional Arrecife de Puerto Morelos [2004], Parque Nacional Sistema Arrecifes Veracruzano [2004] and Parque Nacional Arrecifes de Cozumel [2005] all in Mexico, Isla de Annobón [2003] in Equatorial Guinea, and Jaluit Atoll [2004] in the Marshall Islands.

⁹⁹ Declared a protected area in 1983 under Egyptian Law 102 of 1983.

in the US.¹⁰⁰ As the *Strategic Framework and Guidelines for the Future Development of the List* notes, there needs to be consistency between national and international approaches.¹⁰¹ It is noteworthy, however, that the Egyptian government recently reported that, while coral reef sites would be considered for future designation, the limited financial and manpower resources available were already being used for existing sites included in the Montreux Record.¹⁰²

The recent national reports to the Eighth COP held in 2002 indicate possible future developments in this area. The standard report template highlights under-represented wetland types as a common concern of the convention and, in part 6.2.3, asks whether contracting parties with such wetland types have given special attention to identifying suitable sites for designation. Of the contracting parties with jurisdiction over coral reefs who returned reports, 27 suggested that they had or would be identifying suitable coral reef sites for designation.

A number of responses were particularly notable and encouraging. For example, Trinidad and Tobago hoped to designate the Buccoo Reef site by 2002, although this has not yet been achieved. In addition, the US claimed that steps were underway to designate a coral reef site in Hawaii, whilst the government of the Philippines planned further designations of coral reef sites following completion of its national inventory of potential sites.

Such reports are encouraging, although obviously actual designations will be needed. Given these responses, Bureau provision of support and encouragement to these

¹⁰⁰ Designated a national marine sanctuary in 1990 under the National Marine Sanctuaries Act 16 U.S.C. sections 1431-1445.

¹⁰¹ *Supra* n. 14 at para 42.

¹⁰² National Report of Egypt to COP 8 at para 6.2.3.

States would clearly encourage increasing representation of coral reefs, as well as focusing attention on others who already actively pursue a national conservation policy of creating protected areas for significant coral reef sites. Further, the Bureau should focus upon those regions highlighted by scientists in the field as being where coral reef ecosystems are threatened, and which therefore should be designated in accordance with the guidelines.¹⁰³

Recent events should provide significant impetus to such efforts. In May 2003, Margarita Astralaga indicated that there was not a single dedicated coral reef site amongst those in the Ramsar List.¹⁰⁴ This statement seems to imply that up to that date coral reefs had not motivated any designations, although, as mentioned, the available data is difficult to interpret on this issue. However, such a claim might not now be repeated, for in February 2004,¹⁰⁵ Mexico designated two sites, Parque Nacional Arrecife de Puerto Morelos and Parque Nacional Sistema Arrecife Veracruzano, apparently because of the importance of their coral reefs. In the general description provided to the Bureau, coral reefs are the dominant wetland type, with the former site described as part of the second largest reef formation in the world, containing rich biological communities of importance to local communities for tourism, fishing and scientific activities. The latter seems equally important, comprising 23 coral reefs in two distinct areas, rising from depths of around 40m, which are home to diverse species that attract many recreational divers.

¹⁰³ For example, C. M. Roberts *et al.*, "Marine Biodiversity Hotspots and Conservation Priorities for Tropical Reefs" (2002) 29(5) *Science* 1280.

¹⁰⁴ *Supra* n. 7 at 22.

¹⁰⁵ Incidentally, on 2 February 2004 which was the 7th Annual Ramsar World Wetlands Day.

Whilst involving only two sites, this development represents a significant achievement for the convention, offering a lead and encouragement for similar designations in the future.

8. RAMSAR AND THE INTERNATIONAL COMMUNITY

As mentioned earlier, the Bureau has taken steps to consolidate its position on the international stage with respect to coral reef ecosystem conservation. To this end, Ramsar has been represented at, and hosted, recent meetings of the International Coral Reef Initiative (“ICRI”).¹⁰⁶ Further, at the Ninth ICRI Symposium, the co-chair of the ICRI secretariat expressed his belief that Ramsar was an important tool for coral reef conservation and that close ties needed to be maintained between the two organisations.¹⁰⁷

Meanwhile, in 2003, Delmar Blasco, the Secretary-General of Ramsar, addressed the Governing Council of UNEP and took the opportunity to highlight Ramsar’s initiatives to designate coral reefs as wetlands of international importance.¹⁰⁸ He pressed the Governing Council to include reference to Ramsar contracting parties designating such sites in the Council’s planned decision on coral reefs. Such recognition that Ramsar played a role in the conservation of coral reef ecosystems would have been politically important, but this was not to transpire. Instead the Governing Council simply recognised that member countries were parties to unnamed

¹⁰⁶ For information on ICRI, see Chapter 5.

¹⁰⁷ G. Cintron, *Report: 9th International Coral Reef Symposium & ICRI Coordination and Planning Committee Meeting*, October 2000 at para. 19 (available at www.ramsar.org).

¹⁰⁸ Ramsar Address to the Governing Council of UNEP, February 2003 (available at www.ramsar.org).

MEAs and that co-ordination of work programmes needed to be improved under such agreements.¹⁰⁹

Despite this, and perhaps more significantly, the CBD has been more willing to recognise Ramsar's competence with respect to coral reefs. This has been reflected in decisions of the CBD contracting parties relating to coral reefs, where Ramsar's involvement has been requested.¹¹⁰

Ramsar has also entered into a number of arrangements with other MEAs in an effort to reduce duplication of work and demands through co-ordinated action and sharing of resources and knowledge. Notably to this end, agreements have been completed with the World Heritage Convention¹¹¹ and the CBD.¹¹² The latter arrangement has been successful in that three Joint Work Plans have been concluded. These plans explore the synergies between the conventions and promote further co-operation. In particular, in 2000, it was recognised that the Ramsar Convention had many areas of common concern with the CBD Jakarta Mandate – the plan of action under the CBD for applying the convention to marine and coastal biodiversity.¹¹³ Greater integration in respect of these marine and coastal issues is evident in the current Joint Work Plan, which provides for Ramsar representation on the CBD's ad hoc expert group on marine and coastal protected areas and an ongoing evaluation of how the new Ramsar guidelines for designating coral reefs as wetlands of international importance can

¹⁰⁹ UNEP Governing Council Decision 22/1 IV.

¹¹⁰ See for example CBD Decision IV/5, Part II, para 1, and CBD Decision V/3, Part I, para 4.

¹¹¹ Memorandum of Understanding, 14 May 1999.

¹¹² Memorandum of Cooperation, 19 January 1996. The increased importance of this working arrangement should be remembered in the light of the inadequacies of CBD Article 22 (Relationship with Other International Conventions) as discussed in Chapter 7.

¹¹³ 2nd Joint Work Plan, May 2000, para 2.

contribute to the CBD's programme on marine and coastal biological diversity, and specifically that programme's work on coral reefs.¹¹⁴

One important context in which such contribution may take place is, of course, MPAs. The CBD's recently adopted programme of work for protected areas which, *inter alia*, sets itself the goal of developing a network of effectively managed MPAs by 2012, was discussed in Chapter 7.¹¹⁵ Ramsar can offer a framework of action for contributing towards such CBD goals, guiding states as to how this should be achieved and providing a mechanism to monitor progress.¹¹⁶ Indeed, as was noted in Chapter 7, the CBD has already needed to resort to data acquired by Ramsar in order to assess progress.¹¹⁷

Of course, the importance of Ramsar in increasing the number of MPAs may be limited, given that the majority of listed sites already existed within nature reserves before designation and only a few became protected areas afterward.¹¹⁸ However, as was also mentioned earlier, some States do seem to take the opportunity to enlarge nature reserves when listing under Ramsar, and the added recognition, access to funding and information, and exposure to international scrutiny of sites should promote the effective management of these protected areas. As the CBD concerns itself more and more with implementation of its programmes of work through such

¹¹⁴ 3rd Joint Work Plan, April 2002, para 3.1 and 3.4.

¹¹⁵ CBD Decision VII/28, para 18, and also reflected in the CBD's *Elaborated Programme of Work on Marine and Coastal Biological Diversity*

¹¹⁶ Note that with one exception, all of the state parties to Ramsar in which coral reefs are located, are also parties to the CBD.

¹¹⁷ *Review of Implementation of the Programme of Work on Protected Areas for the Period 2004-2006* 1 February 2006 (UNEP/CBD/COP/8/29) at para. 17.

¹¹⁸ See further Birnie and Boyle, *supra* n. 38 at 618.

targets and co-operative arrangements with other conventions, the importance of Ramsar's ability to contribute to meeting such goals will surely increase and must surely be more clearly recognised by the CBD.¹¹⁹

It is clear that, in recent years, Ramsar's reputation for work in conserving coral reef ecosystems has grown. However, Ramsar is not the only MEA that aims to tackle the negative impacts upon coral reefs. Opinion can vary, therefore, as to which is the most appropriate forum through which states should channel their energies in order to tackle the various threats to coral reefs: Ramsar, the World Heritage Convention, the Regional Seas Programme, CBD etc? In such circumstances, various MEAs may seek to assert a predominant position and conflicts and 'turf wars' can then arise.¹²⁰ Encouraging co-operation and co-ordination appears to be the key. Understanding the advantages and limitations of Ramsar is therefore of great importance. Some have already been noted (such as geographical coverage) but others also demand consideration.

¹¹⁹ Ramsar has expressed its concerns that the CBD is failing to acknowledge the contributions of the 700+ Listed Wetlands found in coastal, inshore and tidal systems towards achieving the CBD's programme of work on marine and coastal biodiversity, and how these sites offer important building blocks in any protected area network. Resolution IX.22, para 7.

¹²⁰ This was noted as a possibility in international environmental law by C. Stone, "Stemming the Loss of Biological Diversity: The Institutional and Ethical Contours" (1997) 6(3) *RECIEL* 231 at 232. See also V. Koester, "The Biodiversity Convention Negotiation Process and Some Comments on the Outcome" (1997) 27(3) *Environmental Policy & Law* 175 at 183, again in the context of the CBD:

There is no doubt that there were tensions between UNEP and the other international organisations at the beginning of the [CBD negotiation] process. First of all FAO, because some of the subjects dealt with belonged to the competence of FAO ... Briefly: The tensions were caused by jealousy, competition and ambitions.

One apparent weakness flows from the obligations of the parties, which have been described as vague and vacuous,¹²¹ due in part to the tendency to couch obligations in terms of promoting their fulfilment, and then only “as far as possible.” Unfortunately such language is a common feature of many conventions, and may indeed simply be a reflection of the common but differentiated responsibilities principle.¹²² Further, some may point to a weakness in the Ramsar system being the need for much of the detail to be contained in soft law documents, such as guidelines and manuals – although such flexibility may equally be an advantage for future development.

Of course, some advantages are easier to recognise. One can be noted if Ramsar is compared to the World Heritage Convention.¹²³ Whilst both maintain lists that include coral reefs that are either internationally important or universally outstanding, respectively, the group of non-listed coral reefs that remain protected under Ramsar is far broader than under the World Heritage Convention. Under Ramsar, the wise use obligation applies, as has been argued earlier, to all coral reefs. The World Heritage Convention’s obligation to protect and conserve non-listed sites of natural heritage only applies to those properties that still meet the exclusive definition of such natural heritage – namely coral reefs identified by a state party as being of outstanding universal value.¹²⁴ Ramsar’s protection is therefore potentially inclusive of all coral reefs on the earth, limited only by state membership.

¹²¹ Bowman (1995), *supra* n. 9 at 11.

¹²² See A. Boyle, “The Rio Convention on Biological Diversity” in M.J. Bowman and C. Redgwell (eds.), *International Law & the Conservation of Biological Diversity* (Kluwer) (1996) 33 at 44-45.

¹²³ See for more detail Chapter 9.

¹²⁴ World Heritage Convention Articles 2 and 3.

An additional way in which Ramsar can be seen in a favourable light is in its basic approach. According to Diane Tarte, in her presentation to the parties at the Brisbane COP in 1996, Ramsar was uniquely equipped to deal with coral reef ecosystems:

Given the linkages, both biological and hydrological, between inshore and estuarine ecosystems and coastal freshwater and riverine systems, it is essential that conservation and management measures for all wetlands in marine and coastal areas be covered by the same convention. This is what Ramsar can provide. No other convention so explicitly includes coral reefs and provides a framework for conservation and wise use.¹²⁵

Despite this author's reservations regarding the 'explicitness' of Ramsar's application to coral reefs, many of Diane Tarte's observations hold true. In particular, Ramsar's strength is its clear and simple framework of action for states that can be easily implemented by those involved in government and at other national levels.

Given such a straight-forward approach, it is important to be satisfied that this is not at the expense of technical or scientific rigour. The technical and scientific competence of Ramsar therefore deserves investigation, and this can be done on a number of levels.

First, how well equipped is the COP to consider coral reef recommendations or resolutions? This is a familiar issue which has already been discussed in the context of the CBD. The ability of such Ramsar conferences to monitor and foster implementation and to further the convention's objectives is dependent upon delegates being well versed in wetland matters in order to understand and make

¹²⁵ D. Tarte & R. Lindsay, "Wetlands in the Coastal Zone and Peatlands - A Key Role for Ramsar" in *Themes for the Future – Special Intervention*, 3rd Plenary Session, 21 March 1996, Brisbane COP.

valuable contributions to the items on any given agenda. Article 7(1) provides that representatives of contracting parties at conferences should include wetland or waterfowl experts. Unfortunately, and whilst further research into this question and its consequences may be needed, it seems unlikely that states will be able to send representatives who are experts in the full range of wetland types now covered by Ramsar, including coral reefs. Developed states and host nations may be able to send more than one specialist to meetings, but others may have limited expertise and resources for sending suitable delegates. Given the predominant distribution of coral reefs in developing countries, this may be a particular problem.¹²⁶

One possible result is that Ramsar delegates place a heightened degree of reliance upon the reports of the STRP when considering resolutions or recommendations. The quality of the STRP's advice is therefore of particular interest.

Unfortunately, from a coral reef perspective, the present members of the STRP do not claim to be experts in relation to coral issues, although a number of the national focal points do. However, whilst no one at the Ramsar Bureau is expected to be an expert in any particular field, the regional technical officers have taken a lead on certain issues, with Margarita Astralaga taking responsibility for coral issues.¹²⁷ In this capacity, Ms Astralaga attended a recent ICRI meeting hosted at Ramsar's headquarters in Gland.¹²⁸ In addition, through the agreement and joint work plans

¹²⁶ This may not be such an issue in other fora, e.g. delegates attending ICRI meetings need not be so familiar with such a diverse range of subjects.

¹²⁷ Private communications with Dwight Peck, Executive Assistant for Communications, whose assistance has been greatly appreciated.

¹²⁸ *Supra* n. 7.

concluded with the CBD, Ramsar has access to the 40 coral reef specialists on the CBD roster of experts.¹²⁹

It might therefore be wrong to disparage Ramsar on scientific grounds. In relation to staying informed of scientific developments, it is in fact possible to argue that Ramsar is in a good position and that this is reflected, as noted earlier, in the standard of scientific advice being given to parties. It may not be leading the way in furthering scientific knowledge on coral reefs, but this need not be a Ramsar concern. A body like ICRI is better placed to pursue such aims, and through attending ICRI meetings the STRP and Ramsar can stay abreast of scientific developments and ensure that policy documents can be founded on up-to-date science.

It strikes the author that whilst some criticisms of Ramsar may be discernible, a number of strengths can be identified. As a framework and legal basis for bringing about action on the part of states to further the conservation of coral reef ecosystem, coupled to the inherent role of MPAs in meeting the convention's objectives, Ramsar clearly has much to offer and a central role to play for promoting such strategies in order to conserve these habitats.

9. CONCLUSIONS

At the start of this section, it was suggested that Ramsar had been overlooked or undervalued as an MEA dealing with many of the problems faced by coral reef ecosystems. Through looking closely at the way in which Ramsar does address these habitats, this study has been able to redress the balance.

¹²⁹ See to this end CBD/Ramsar Joint Work Plan 1998-1999, para 11(c) and CBD/Ramsar Joint Work Plan 2000-2001, para 15

The initial analysis concentrated upon how MPAs are promoted as an integral strategy within the Ramsar framework for conserving wetlands. As such, it was noted that with respect to enclave strategies, Ramsar may be able to enhance the management and running of such protected areas, even if it may not currently be acting specifically as a catalyst for the establishment of new marine parks.

The remainder of the chapter has analysed Ramsar from the perspective of its competence to deal with, and progress in protecting, coral reef ecosystems. Initially to this end, it was necessary to question whether the definition of wetlands included coral reefs. As became apparent, the main concern was that not all areas of coral reefs fell within the definition and that this could have given reluctant parties grounds for not taking action on all coral reefs within their jurisdiction. As was concluded, this may in fact be a difficult position to maintain, particularly given the conservation obligations imposed upon state parties and state practice on interpreting the scope of the wetland definition.

In assessing the second limb of due competence (geographical coverage) it was also possible to see major advances since 1984, when Wells highlighted Ramsar's failure to encourage enough coral reef nations to join the regime as parties. With over 83% of coral reefs now falling within the convention's remit, Ramsar has great potential for benefiting a large area of coral reef habitat. More needs to be done, but history suggests that Ramsar should be well positioned to attract more States to join.

Efforts in the last decade to raise awareness of coral issues under the convention, and to promote further action, have coincided with more sites being listed which contain coral reefs. This compares favourably with 1984, whilst the apparent lead taken by Mexico in designating sites because of the coral reefs found therein offers significant encouragement and potential impetus for future listings. Wells' concern that

Ramsar's potential remained largely unrealised due to insufficient listing of coral reef sites, could therefore be even further allayed if such recent events become more commonplace.

Finally, whilst efforts by Ramsar to promote its activities within the international environmental arena have been explained, thoughts on Ramsar's strengths and weaknesses have been offered in order to assist with future co-operative planning with other pertinent MEAs. This revealed that Ramsar does seem to be well positioned in a number of respects, including geographical coverage, scientific expertise, potential global inclusiveness compared to more exclusive MEAs, and a clear regime for governments to abide by and implement. Perhaps significantly, the CBD seems to be working closely with, and relying upon the information gathered by, Ramsar in order to further the former's own objectives for conserving coral reef ecosystems; Ramsar, after all, offers a more focused approach than the CBD's broad agenda. Such relationships will become more and more important to the CBD as it moves from its initial policy development phase into more detailed programming and implementation by contracting states. Greater recognition to this effect by the CBD would be welcome.

Ultimately it is clear that Ramsar is actively trying to help coral reef ecosystems and is generating a response from contracting parties. This in turn has positive implications for the promotion of MPAs as a strategy for conserving these habitats. International environmental law therefore has a powerful regime for addressing many of the problems facing these valuable ecosystems. Consequently, to continue to overlook or underestimate Ramsar as a principal international legal regime for conserving coral reef ecosystems through MPA strategies seems particularly unwise.

CHAPTER NINE - THE WORLD HERITAGE CONVENTION

1. INTRODUCTION

On the 17th December 1975, the Convention Concerning the Protection of the World Cultural and Natural Heritage (“**World Heritage Convention**”) entered into force.¹ The text, which had been adopted just over three years previously at the General Assembly of UNESCO, and shortly after the United Nations Conference on the Human Environment held in Stockholm, was the result of two international initiatives supported by UNESCO and IUCN.

In 1960, the construction of the Aswan High Dam threatened a number of important Egyptian monuments including the temple of Ramses II at Abu Simbel. International campaigns organised by, amongst others, UNESCO, raised enough money to support the now famous relocation and conservation plans which the Egyptian government completed for the Abu Simbel monuments.² In the light of this and other campaigns to save cultural properties, UNESCO took the view that the mobilization of international assistance would benefit from a formalised, rather than ad hoc, procedure.

In addition, an idea was developing within IUCN that there existed throughout the world natural and cultural areas of such value, that these sites should be placed in

¹ 11 I.L.M. 1358. For the purposes of the footnotes, the convention will be referred to by the abbreviation “WHC”.

² S. Lyster, *International Wildlife Law* (CUP) (1985) at 208.

trust for all mankind since they were a part of the heritage of every man, not only individual nations.³

Whilst work had therefore begun within UNESCO to formulate a convention on cultural heritage alone, parallel advocacy by IUCN for a joint cultural and natural heritage agreement began to have an impact. Ultimately this resulted in a compromise text which became the World Heritage Convention with its dual focus on both cultural and natural heritage.⁴

This step of including natural heritage has significantly enhanced the portfolio of international environmental laws dealing with the conservation of wildlife. In conjunction with the Ramsar Convention on Wetlands, the Convention on Biological Diversity and the Convention on Migratory Species (all of which are discussed elsewhere in this study), the World Heritage Convention is widely regarded as one of the centrepiece multilateral environmental agreements (“MEAs”) concerned with wildlife conservation.⁵ As will be seen in this chapter, this significance can be attributed to the commitments contracting parties are willing to make in return for the prestige and perceived economic advantages⁶ they can garner through the recognition the convention offers to sites. Indeed, as Lyster notes, the convention was, at the time

³ H. K. Eidsvik, “The World Heritage Convention, Yesterday – Today – and Tomorrow. An Overview” in Workshop Papers from the 18th General Assembly of IUCN, *Critical Issues for Protected Areas Part 1: World Heritage Session* (IUCN) (1990) 15 at 15.

⁴ S. M. Titchen, “Challenging the Spirit: A Brief History” (2001) 2 *World Conservation* 6 at 6.

⁵ P. Birnie and A. Boyle, *International Law and the Environment* (OUP) (2002, 2nd Ed.) at 616 and Lyster, *supra* n. 2 at 179-181.

⁶ Report of the International Workshop, *Managing Tourism in Natural Heritage Sites*, Dakar, November 1993, at 13. That recognition of a site can bring increased tourism revenues has been questioned in C. Tisdell and C. Wilson, “World Heritage Listing of Australian Natural Sites: Tourism Stimulus and its Economic Value” (2002) 32(2) *Economic Analysis & Policy* 27.

of its adoption, one of the only treaties to offer developing countries a material incentive to protect outstanding habitats.⁷

This chapter will therefore explore whether the World Heritage Convention should be regarded as an equally significant agreement from the more focused perspective of this study, namely the promotion of marine protected area (“MPA”) strategies for the conservation of coral reef ecosystems. This question requires analysis of the convention’s operation and the way in which it is being used (if at all) to conserve these habitats within protected areas. Whilst this exercise will therefore focus primarily on the protection of natural heritage, where pertinent, reference to the handling of cultural heritage under the convention will also be made.

2. AN OVERVIEW OF THE CONVENTION’S PROVISIONS AND STRUCTURE

An analysis of the convention’s provisions and operation is the first step to be undertaken in this chapter, focusing upon areas of relevance to the later discussion of the treatment of coral reefs and MPAs. This requires looking at the definitional scope of the convention, the World Heritage lists, the legal commitments of the parties, the funding available to contracting parties, the agreement’s administration and the strategic directions in which the convention hopes to move in the immediate future.

2.1 DEFINING NATURAL HERITAGE

The World Heritage Convention applies to both cultural and natural heritage as defined in Articles 1 and 2 respectively. In summary, Article 2 defines natural heritage as:

⁷ Lyster, *supra* n. 2 at 209. Indeed, the WHC remains one of only a few MEAs to offer such incentives.

- a) Natural features consisting of physical and biological formations of “outstanding universal value” scientifically or aesthetically;
- b) The habitat (which may be geophysical or physiographical) of threatened species of plants and animals which are of “outstanding universal value” in terms of science, and conservation; and
- c) Natural sites or areas of “outstanding universal value” from the point of view of science, conservation or natural beauty.

The authority for identifying and delineating the sites which meet this definition is left to the contracting party and is limited to areas situated within that state’s territory.⁸

Article 2 produces two difficulties in its interpretation. First, it is difficult to conceptualise the intended divisions between the examples described in the subparagraphs in real terms and, second, there is no further guidance in the Convention as to how a party should determine what is of “outstanding universal value”.

Extra guidance has been made available to interpret definitions and key terms, in this instance through the *Operational Guidelines for the Implementation of the World Heritage Convention* – a document which has been drafted and continually updated as part of the Convention’s work (the “Guidelines”).⁹ They define outstanding universal value as:

⁸ WHC Article 3.

⁹ *Operational Guidelines for the Implementation of the World Heritage Convention*, 2 February 2005 available at www.whc.unesco.org. The Guidelines are mainly intended to inform contracting parties about the principles which guide the way the World Heritage Committee and world heritage lists work (both of which are described in detail later).

natural significance which is so exceptional as to transcend national boundaries and to be of common importance for present and future generations of all humanity¹⁰

The Guidelines go further in helping to understand this concept by setting out additional criteria for determining which natural areas will be regarded as having outstanding universal value. These criteria are set out by reference to four types of natural area:

- 1) Outstanding examples of the earth's historical and ongoing development in geological terms, such as glaciated or volcanic landscapes, as well as the record of life on earth, such as landscapes rich in fossil deposits;
- 2) Outstanding examples of significant on-going ecological and biological processes which support the development of ecosystems;
- 3) Areas of superlative natural phenomena or exceptional natural beauty; and
- 4) The most important and significant habitat for *in-situ* conservation of biodiversity and threatened species of outstanding universal value to science or conservation.¹¹

Of course, it is possible for an area to exhibit a number of these characteristics, and in the case of coral reefs it is quite likely that an area might fit in all of the last three. Most importantly, though, it can be seen that the drafting of Article 2 is broad enough to include coral reefs, provided individual sites satisfy the requirements of outstanding universal value, and are recognised as such by the contracting party concerned.

¹⁰ Guidelines para 49.

¹¹ Guidelines para 77.

This underlines one of the most significant, albeit intentional, limitations of the World Heritage Convention. The exclusivity of the habitats or areas to be included, limited to the 'best of the best' through the outstanding universal value test, excludes most natural areas. As the Guidelines confirm:

The Convention is not intended to ensure the protection of all properties of great interest, importance or value, but only for a select list of the most outstanding of these from an international viewpoint. It is not to be assumed that a property of national and/or regional importance will automatically be inscribed on the World Heritage List.¹²

The World Heritage Convention could not on its own, therefore, be relied upon by the international community to promote the conservation of all coral reefs, irrespective of any particular conservation strategy adopted by the agreement. This is a fundamental limitation in comparison to other MEAs which are considered in this study. This must, therefore, continue to be born in mind, even though later discussions will commend the convention for advantages it offers to those coral reef sites which have met the outstanding universal value test.

2.2 THE WORLD HERITAGE LIST

If the World Heritage Convention was to act as a formalised system for the mobilisation of international responsibility and support for the earth's outstanding heritage, an identification system needed to be put in place to determine which sites should benefit. The system employed centres around the keeping of an official list of sites which have been independently identified as being of outstanding natural value – the World Heritage List. This list is maintained by the Intergovernmental Committee

¹² Guidelines para 52.

for the Protection of the Cultural and Natural Heritage of Outstanding Universal Value; the World Heritage Committee for short.

The listing mechanism employed breaks down into the following stages. First, state parties must identify sites which they feel fall within the Article 1 and 2 definitions (a process which should involve the production of inventories).¹³ In accordance with the convention's provisions and the Guidelines, 'Tentative Lists' should be produced (on the basis of the inventories) of the properties the state would like to see included in the World Heritage List over the following years.¹⁴ The state then applies to the World Heritage Committee for a particular site to be included in the World Heritage List – termed the nomination process. These first two steps respect the sovereignty of contracting parties, for the sites must be situated in the nominating state party's boundaries and it is not in the power of the convention, nor another state, to tell a contracting party to nominate a particular area. As Lyster summarises the position:

however much the Committee might think a site worthy of inclusion in the List, it only becomes eligible for selection after the party in whose territory it is situated has made an appropriate proposal.¹⁵

Thereafter, however, the mechanism emphasises the independent control of the regime over the World Heritage List which stipulates that it is for the World Heritage Committee to “*establish, keep up to date and publish*” the list.¹⁶ It is the Committee

¹³ WHC Article 3.

¹⁴ WHC Article 11(1) and Guidelines paras 62 and 65. The original terminology of inventories as used in the convention has given way to that of tentative lists. This helps to distinguish this document from the desired preceding step of producing national inventories which are for information purposes and use at the national level.

¹⁵ Lyster, *supra* n. 2 at 211.

¹⁶ WHC Article 11(2).

that must agree to inscribe a property, pursuant to an objective, scientific and thorough procedure.

Therefore, nominated sites are first assessed in accordance with the procedures in the Guidelines by the international organisations which have been retained to assist in the operation of the convention, on account of their expertise in cultural or natural heritage issues. This function is performed by IUCN for natural properties. Following this assessment of a nominated natural property, a report is prepared for the World Heritage Committee by IUCN. The World Heritage Committee then decides, by a two-thirds majority of the members present and voting, whether the property should be inscribed on the list.

In the same way that the World Heritage Committee independently controls which sites should go on the list, it is for the same Committee to determine when a property should also be removed.¹⁷ This is permitted in two situations, namely:

- 1) where the property has deteriorated to the extent that it has lost the characteristics which merited its inclusion in the first place; or
- 2) where the intrinsic characteristics were already threatened by man at the time of listing and where corrective measures outlined by the proposing state at the time of listing have not been taken within the proposed time.¹⁸

Information on this state of affairs should come from the relevant contracting party, although this is not a stipulation. Where the relevant contracting party is not the originating source, that source and the information presented must be verified in consultation with the state concerned. IUCN would also be requested to comment on

¹⁷ Guidelines Section IV.C.

¹⁸ Guidelines para 192.

the information. Ultimately, the World Heritage Committee can then order that the site be removed from the list. That decision may not be made without first consulting the relevant state, although crucially the Guidelines do not require prior consent to de-listing. Whilst such an event has not occurred to date, the procedure confirms the independent authority of the regime, rather than the individual contracting parties, over the content of the World Heritage List.

The entire process described above plays a key role in the strategy behind the convention. Eventual inscription on the World Heritage List provides many of the benefits already alluded to (prestige and potential tourist revenue) and others which will be explored later - such as strengthening the position of environmental ministries in intra-governmental policy decisions. Listing also confirms that the property inscribed needs to be preserved as part of the world heritage of mankind as a whole.¹⁹

The implied interest of the international community in such areas of heritage therefore entitles the state party, amongst other things, to apply for assistance from the international community through the World Heritage Fund and from other contracting parties. These benefits ensure that the attraction of listing is tempting enough to outweigh the subsequent monitoring of listed sites on behalf of the international community and the autonomy of the World Heritage Committee over the list itself. This careful balance between benefit and burden, however, relies upon the maintenance of a sense of exclusivity in the group of properties listed, and it is here that the Guidelines and IUCN play a significant role.

The challenges faced by the regime are, first, to encourage states to identify and delineate all types of areas in their territory which are truly outstanding; second, for states to then actually nominate those areas; and finally for the World Heritage

¹⁹ WHC Preamble.

Committee to verify in an independent manner that only sites which are of outstanding universal value have been nominated and are inscribed on the list. Each of these three challenges can be influenced to a degree by IUCN and the World Heritage Committee. For example, independent inventories can and have been produced by IUCN, of sites which they regard as being the natural heritage of the world.²⁰ Such publications can assist states with restricted resources to produce inventories and nominations, give some indication of sites more likely to be inscribed in the list (thus helping states to use resources more efficiently) and to bring pressure to bear on states by revealing omissions in their world heritage plans. More particularly, however, the World Heritage Committee, with the assistance of IUCN where pertinent, utilises the Guidelines. The Guidelines set out the procedures and conditions which a property must meet to be eligible for listing, thereby assisting states in their identification and nomination work, and setting out in a transparent manner the way in which the World Heritage Committee makes decisions on admission to the list.

It has already been noted how the criteria in the Guidelines have provided advice to parties on the types of natural properties which will be included in the list as well as guidance on the meaning of outstanding universal value. In addition, the Guidelines indicate that nominated natural sites will only be accepted if they satisfy a number of conditions related to the integrity of the site.²¹ The principal conditions of integrity vary according to the type of property nominated, as shown in Table 2. In addition, all

²⁰ For example, *The World's Greatest Natural Areas: An Indicative Inventory of Natural Sites of World Heritage Quality* (IUCN) (1982).

²¹ Guidelines para 88: "*Integrity is a measure of the wholeness and intactness of the natural... heritage and its attributes*".

natural properties nominated should have management plans for the site²² together with adequate long term legislative, regulatory, institutional or traditional protection.²³

Table 2 – Principal Conditions of Integrity²⁴

Type of Natural Property	Corresponding Condition of Integrity
Outstanding examples of the earth’s historical and ongoing development in geological terms, such as glaciated or volcanic landscapes, as well as the record of life on earth, such as landscapes rich in fossil deposits.	The nominated site should contain all or most of the key interrelated and interdependent elements in their natural relationships e.g. an “ice age” landscape should include the snow field, glacier and physical results of the related process such as erratics, moraines and striations.
Outstanding examples of on-going ecological and biological processes which support the development of ecosystems.	The nominated site should be of sufficient size and include elements needed to demonstrate key aspects of processes essential for the long-term conservation of the ecosystem e.g. a coral reef should include seagrasses, mangroves or adjacent ecosystems that regulate the reef.
Areas of superlative natural phenomena or exceptional natural beauty.	The nominated site should include areas essential for maintaining the beauty of the site e.g. a waterfall should include linked catchments and downstream areas.
The most important and significant habitat for conservation of biodiversity and threatened species of outstanding universal value to science or conservation	The nominated site should contain habitats for maintaining the most diverse fauna and flora of the biogeographic province proposed.

²² Guidelines para 108.

²³ Guidelines para 97. Nominations must also be submitted on the standard forms set out in the Guidelines.

²⁴ Guidelines paras 92-95. For a similar diagrammatic representation of these relationships, see D. J. Haigh, “World Heritage – Principle and Practice: a Case for Change” (2000) 17(3) *Environmental and Planning Law Journal* 199 at 201.

In the light of the above, and bearing in mind also the recommendations in the Guidelines to nominate sites with buffer zones around boundaries and with the participation of local people,²⁵ it is clear that the nomination of a coral reef site should correspond with the recommended practices for establishing MPAs. The fact that most of these measures must be incorporated from the outset, or that at least the state can demonstrate a framework for implementing such measures, is a positive feature of the listing process and the World Heritage Convention for it strives to make 'good practice' a pre-condition of the receipt of benefits under the regime.

In summary, a natural property will only qualify for inclusion in the World Heritage List if it meets one or more of the criteria and all of the relevant conditions of integrity. It is for the state party to identify and nominate sites, following which admission to the World Heritage List is decided upon by the World Heritage Committee (with assistance from IUCN) after an objective and scientifically rigorous procedure. Ultimately, a site may be removed from the list by the Committee, thereby confirming the independence and control of the regime over the list. This independence and exclusivity is of fundamental importance to ensuring that the international community is only obliged to assist with protecting and conserving properties which are truly the world's heritage, and for inscribed properties to be given special significance with the resulting benefits this brings host states.

2.3 THE WORLD HERITAGE CONVENTION AND THE PROMOTION OF MPA STRATEGIES

UNEP recently recognised that MPAs are a part of the World Heritage Convention's approach to the conservation of coral reef ecosystems.²⁶ However, the promotion of

²⁵ Guidelines paras 103 and 123 respectively.

²⁶ UNEP/WCMC, *Conventions and Coral Reefs* (2003) at 7.

such enclave strategies is not so obvious from the drafting of the agreement; there is no specific obligation or duty to promote such approaches to conservation in the convention's text, in contrast to other MEAs like the Ramsar Convention. Instead it will be argued that protected area strategies are an inherent part of the convention's structure and are also promoted through the conditions of integrity which a state must meet in order to succeed in the nomination of a property to the World Heritage List.

It was noted in the preceding sub-section that one of the conditions of integrity for natural properties nominated for the World Heritage List was adequate long-term legislative, regulatory, institutional and/or traditional forms of protection and management. The Guidelines state that the delineation of boundaries is an essential requirement for providing such adequate management and protection²⁷ and that these boundaries may coincide with existing or proposed nationally protected areas.²⁸ Two consequences flow from this.

First, the contracting parties have responded in different ways to the nomination process and the drawing of boundaries. As Lyster notes, some, like the USA, have chosen to pursue a policy of nominating sites which are already managed within national, and/or international, protected areas. In other instances, sites have been nominated which are not so protected, with the creation or extension of existing protected areas being promised post-inscription.²⁹ The former policy appears to dominate amongst the coral reef properties which have been inscribed on the World Heritage List, although in a few instances, such as Aldabra Atoll in the Seychelles and Sian Ka'an in Mexico, the national protected areas were only created in the year

²⁷ Guidelines para 99.

²⁸ Guidelines para 102.

²⁹ Lyster, *supra* n. 2 at 216-217.

preceding nomination, suggesting that this step may have been taken to strengthen the properties nomination chances. Like the Ramsar Convention, the World Heritage Convention may therefore be of limited help in increasing the number of MPAs for coral reefs except in a minority of cases. The real value of the agreement might therefore similarly lie in promoting better management and tackling the problem of 'paper parks'.

Second, the drawing of boundaries, particularly in defining the property under consideration during the nomination process and which will ultimately govern the area inscribed, is itself a mechanism for promoting protected areas. As was argued in the previous chapter on the Ramsar Convention, an MPA is simply a geographically defined area of the sea and/or shoreline which is designated or regulated and managed to achieve specific conservation objectives.³⁰ Since contracting parties must define boundaries to the properties they nominate and have inscribed on the World Heritage List, these boundaries also establish the area in relation to which a state party must act in accordance with the convention's obligations such as to protect and conserve the natural heritage. These obligations, in order to be met, will require implementation at the national level through special measures particular to the World Heritage Site. The end result will inevitably be a protected area in accordance with the definition. The listing mechanism itself is therefore a method for promoting MPAs.

Whilst it is therefore argued that the promotion of MPAs is an implicit part of the convention's operation and indirectly referred to in the Guidelines, such enclaves are not explicitly promoted in the treaty's provisions. Current state practice suggests that the conditions of integrity, and the need to implement the agreement's obligations, are encouraging the majority of contracting parties to nominate existing protected areas.

³⁰ These obligations are discussed in greater detail in section 2.5.

This limits the convention's role in promoting the establishment of more MPAs. However, as will be seen in later sections, the real added benefit for MPAs derived through the World Heritage Convention is found in its ability to enhance management standards for natural heritage properties, and more particularly, coral reef ecosystems.

2.4 THE WORLD HERITAGE IN DANGER LIST

Article 11(4) provides that the World Heritage Committee:

shall establish, keep up to date and publish, whenever circumstances shall so require, under the title of "List of World Heritage in Danger", a list of the property appearing in the World Heritage List for the conservation of which major operations are necessary and for which assistance has been requested... The list may only include such property... as is threatened by serious and specific dangers...

The dangers faced by natural properties may be either "ascertained" i.e. specific and proven imminent danger, or "potential" i.e. major threats which could have deleterious affects on its inherent characteristics. Further, the danger must be one which can be corrected by human action.³¹

The List of World Heritage in Danger (the "Danger List"), is another integral part of the operation of the Convention. Officially at least, this is because inclusion of a property on the Danger List is said to be formal recognition of a state of affairs that calls for safeguarding measures and as a way to secure resources.³² Listing is not intended to amount to a sanction.

³¹ Guidelines paras 180 and 181.

³² "1992 Strategic Orientations" adopted at the 16th Ordinary Session of the World Heritage Committee, para 23.

In practice, the Danger List has been received in differing ways by contracting parties. Some willingly seek listing in order to obtain such assistance and priority attention, whilst others are less receptive to the list possibly because they perceive listing as a humiliating.³³ Given the latter factor, the question of whether a site may be listed against the wishes of a state party has been debated since the preservation of honour may be at the expense of mobilising international assistance to the detriment of the site concerned. Whilst the matter has not been conclusively determined, advice on the matter was provided by the UNESCO legal advisor to the 26th Ordinary Session of the World Heritage Committee in 2002. That opinion suggested that the interpretation which accords best with the convention's text is that, in the ordinary course of affairs, the fact that a request for assistance must have been made before listing, suggests that inclusion should be initiated by the contracting party making a voluntary decision. However, in the case of urgent need, a property can be included on a decision of the World Heritage Committee alone. This is because the concluding sentence of Article 11(4) states that:

The Committee may at any time, in case of urgent need, make a new entry in the List of World Heritage in Danger and publicize such entry immediately.³⁴

³³ T. Atherton and T. C. Atherton, "The Power and the Glory: National Sovereignty and the World Heritage Convention" (1995) 69 *The Australian Law Journal* 631 at 638; J. R. Vernhes, "Implementation of the World Heritage Convention in South East Asia and the Pacific", in Workshop Papers from the 18th General Assembly of IUCN, *Critical Issues for Protected Areas Part 1: World Heritage Session* (1990) 23 at 26.

³⁴ The Guidelines seem to widen the interpretation of UNESCO's legal advisor. They confirm the view that the Committee may inscribe a property on the Danger List when four requirements are met, with one of the requirements being that assistance has been requested. However, that "assistance may be requested by any Committee member or the Secretariat." Guidelines para. 177(d).

Such listings have been made in the past. For example, in 1992, and following unanswered calls for information from the Indian Government, the Manas Nature Reserve was included in the Danger List without the state party's consent or request for assistance.³⁵ However, the interpretation of these provisions by the state parties has proved too contentious to date to allow a common position to be recognised. Nor have guidelines and practice developed sufficiently to aid interpretation of when an "urgent need" will be said to arise.

2.5 OBLIGATIONS OF THE CONTRACTING PARTIES

State parties to the World Heritage Convention undertake to meet a number of obligations. The first are those concerning financial contributions to the World Heritage Fund, and these will be discussed in the following sub-section. The second group are those which relate to the natural heritage as defined in Article 2, and which lie within a state's own territory. It is primarily for that state party to meet these commitments to the utmost of its resources. These obligations (contained in Article 4) are to identify, protect, conserve, present and transmit to future generations such natural heritage. These obligations are supported by Article 5 duties to:

- 1) adopt a policy for giving natural heritage a function in the life of the community and planning programmes,
- 2) set up or ensure that there exists a responsible agency with appropriate staff and means to protect, conserve and present the natural heritage,
- 3) conduct studies to prepare states for counter-acting dangers to the natural heritage,

³⁵ Decision of the 16th Ordinary Session of the World Heritage Committee, VIII.13.

- 4) take the appropriate legal, scientific, technical, administrative and financial measures to identify, protect, conserve, present and re-habilitate natural heritage, and
- 5) foster the establishment or development of national or regional training centres in protection, conservation and presentation of natural heritage as well as scientific research in the area.

In contrast, the obligations under Article 6 relate to the obligations a contracting party owes to the world heritage situated in the territory of other state parties. Thus, Article 6(3) obliges a state party not to take any deliberate measure which might directly or indirectly damage the natural heritage situated in the territory of another participating country. Finally, Article 6(2) obliges states to assist other contracting parties, when so requested, with identification, protection, conservation and presentation of the natural heritage inscribed in the World Heritage List and Danger List.

A couple of fundamental questions arise from these provisions with the potential to affect the conservation of coral reef properties. These are, first, to which properties will these obligations apply? This is significant since it determines the extent of coral reefs which can benefit from the obligations. The second question is, what exactly does the convention mean by protection and conservation?

2.5.1 Identifying the Relevant Properties

The first question seems, initially, easy to answer. With the exception of Article 6(2), all of the obligations under the convention are expressed to be applicable to properties forming part of the world heritage (i.e. as defined in Article 2), irrespective of listing. In contrast, Article 6(2) states that it is limited to listed sites.

The properties referred to in Article 2 are potentially a far larger group than those inscribed by the World Heritage Committee on either of their lists. Having identified the properties falling within Article 2, the contracting party is not obliged to nominate all of the sites for listing,³⁶ but the obligations as referred to above (with the exception of Article 6(2)) will still attach to all such properties.³⁷ This leaves significant power with the contracting parties and highlights problems for imposing obligations on state parties. As Lyster notes, the convention:

does not give a Party (or the World Heritage Committee) the right to say to another Party 'X site on your territory is obviously part of the cultural or natural heritage as defined in Articles 1 and 2, and you are therefore obliged by Articles 4 and 5 to protect it even though it is not on the World Heritage List'... Therefore, unless a Party decides that a site on its territory is part of the cultural or natural heritage as defined by Article 1 and 2, Articles 4 and 5 will not apply to the site.³⁸

³⁶ This might at first seem a strange approach to adopt, as the majority of benefits on offer to states under the World Heritage Convention are only available to listed properties. However, in some federal state systems, the implementing national legislation may allocate powers to the federal government for Article 2 properties, and not just World Heritage Sites. Here, decisions to recognise sites as falling within Article 2 (or 1) regardless of proceeding to listing, may reflect attempts to affect the balance of power between central federal authority and regional state governance. See for example, Lyster, *supra* n. 2 at 226.

³⁷ Judgement of Dawson J, *Queensland v. The Commonwealth* (1989) 167 CLR 232:

The obligation of the State Party to protect, conserve, present and transmit to future generations the cultural and natural heritage situated on its territory does not flow from any listing upon the World Heritage List. It flows from the identification by the State Party of its cultural or natural heritage, an identification which the State Party is under a duty to make.

³⁸ Lyster, *supra* n. 2 at 227.

The central question then becomes, what evidence is sufficient to establish that a state has made such a decision and identified a natural property (perhaps a coral reef area) as falling within Article 2? The answer to this, which may vary from state system to state system, will be important for a range of parties, such as non-governmental organisations, activists, the regime itself and other contracting parties keen to see that all states are meeting their obligations. Further, in federal systems where competence to deal with environmental matters may be divided between the central and regional governments according to whether a site falls under international law or only national law, there is a need to identify Article 2 natural properties in order to determine the responsibilities of the two levels of government. In addition, and more significantly, other contracting state parties must be able to identify the properties which they are obliged to refrain from deliberately damaging in accordance with Article 6(3). What, therefore, are the likely sources of such evidence.

Conclusive evidence that a natural property falls within Article 2 will be the inscription of that property in the World Heritage List by the World Heritage Convention and support for this position has been given by the High Court in Australia.³⁹ However, as was noted earlier, the group of properties inscribed on the list is potentially smaller than those that the state party regards as meeting the Article 2 definition. Therefore it seems the most obvious evidence of this potentially larger group of properties, and of a state's position on any given property, would be its tentative lists. If Article 11(1) is recalled, tentative lists are inventories of properties forming the natural heritage as defined in the convention and which the state party believes are suitable for inclusion in the World Heritage List.

³⁹ *Queensland v. The Commonwealth* (1989) 167 CLR 232.

The problems with tentative lists as evidence are twofold. First, not all state parties have submitted these lists. Whilst capacity to produce them may be a large factor in this state of affairs, if tentative lists are also the evidential basis for attaching obligations to a property before the benefits of World Heritage listing may have been realised, then this may not encourage some states to produce these documents.

The second problem lies in resolving the position of a property which is on an existing list but whose nomination to the World Heritage List has been unsuccessful.

The convention states:

The fact that a property belonging to the cultural or natural heritage has not been included in either of the two lists mentioned in paragraphs 2 and 4 of Article 11 shall in no way be construed to mean that it does not have an outstanding universal value for purposes other than those resulting from inclusion in these lists.⁴⁰

In addition, at the first meeting of the World Heritage Committee in 1977, the Director General of UNESCO expressed the hope that the actions of the Committee would not result in state parties neglecting properties which were not included in the World Heritage List.⁴¹

The implications of this and Article 12 are that a negative decision of the Committee will not be conclusive of a natural property failing to meet the Article 2 definition.⁴²

But that still does not actually provide a complete answer. Whilst the site remains on

⁴⁰ WHC Article 12. The purposes referred to at the end of this provision do not relate to the obligations under Articles 4, 5 and 6.

⁴¹ Report of the 1st Ordinary Session of the World Heritage Committee, para 4.

⁴² This is not to say, however, that the article does not rule out the World Heritage Committee's judgment being evidence in proceedings determining the properties appropriate status with regards to the convention.

a tentative list, and such lists are regarded as important evidence of the properties which fall within Article 2, the interested groups mentioned above, and in particular other contracting parties subject to the Article 6(3) obligation, still need to be able to determine if a state continues to regard the rejected property as being part of the natural heritage. A clear procedure to resolve this issue therefore needs to be formulated, such as an official declaration by the relevant state.

The two types of evidence already discussed above involve producing records for the benefit of the international community; the World Heritage List and tentative lists are made available to the international community as a whole. However, such evidence need not take such a form and could be produced for circulation at the national level. For example, state parties are supposed to produce national inventories of properties regarded as being their cultural and natural heritage, or announcements may be made by governments. Again, given the potential for these lists and announcements to identify the properties to which the obligations under the convention attach, clear procedures need to be in place for these to be available to all relevant and concerned parties.

So far this thesis has attempted to answer the fundamental question regarding the properties to which the obligations under the convention relate. Shortcomings within the current structure of the regime have revealed how difficult it would be to produce with absolute certainty a list of coral reef ecosystems which benefit from the undertakings of contracting parties to the World Heritage Convention. Having looked at this issue, the second fundamental question posited earlier needs to be considered – namely, what exactly does the convention mean when it calls for state parties to protect and conserve natural heritage?

2.5.2 Protection and Conservation

The agreement does not define either of these terms, and in practice, both protection and conservation as terms are used freely in convention documents, along with the additional term “preservation”.⁴³ However, whilst these phrases may not have been used as terms of art by the regime, particularly during the first 20 years, as van Heijnsbergen has noted:

in the development of nature protection law, each of these concepts come [*sic*] to have its own meaning and that meaning can be significant for the legal scope of the provisions of the international documents in which these concepts are to be found.⁴⁴

In summary, these terms can arguably be viewed as having the following particular meanings. Protection has been described as a rather colourless term, suggesting an action to prevent a particular threat which may cause damage, but without defining the future ongoing use of the object of the duty. It has also been used to denote a concern for the welfare of animals, thus carrying more ethical connotations.⁴⁵ Preservation and conservation, however, are concerned with the future management of an object. Preservation has been defined in the past as setting an object aside and protecting it so as to maintain its natural characteristics in a manner unaffected by human activity as far as possible.⁴⁶ This may therefore imply that commercial

⁴³ See entries for “conservation” and “protection” in *Glossary of World Heritage Terms* (June 1996), available at www.whc.unesco.org.

⁴⁴ P. van Heijnsbergen, *International Legal Protection of Wild Fauna and Flora* (IOS Press) (1997) at 43.

⁴⁵ *Ibid.*

⁴⁶ 1991 Draft Covenant on Environmental Conservation and Sustainable Use of Natural Resources quoted in van Heijnsbergen, *supra* n. 44 at 44.

utilization is not permitted under an obligation to preserve a natural area or object.⁴⁷ On the other hand, conservation has been linked to sustainable use of a resource so that it may be enjoyed by present generations whilst maintaining its potential to meet the needs of future generations.⁴⁸ Commercial utilisation is, in theory therefore, permitted so long as it is sustainable. Of course in order to maintain a resource's potential for future generations, short-term protective measures, or long-term preservationist management levels may be needed. Thus conservation can include protection and preservation.⁴⁹

The current free use of these terms within the World Heritage regime without due consideration of the implications is therefore problematic and is an issue which cannot be ignored. As noted by Cameron with respect to the convention:

If the international community is to monitor World Heritage Sites, it must have access to universally agreed-upon standards of conservation – or more accurately, standards for the acceptable limits of change – against which to monitor.⁵⁰

If such a standard can be formulated, and appropriate training and education can be provided, the regime would then be in a position to objectively hold national governments to account over their obligations towards a given property. However the past inconsistent use of modern terms of art has prevented such an approach. It is therefore unclear whether the limit of permitted change set by Article 4 and 5 is one

⁴⁷ *Ibid.*

⁴⁸ See M. J. Bowman, "The Ramsar Convention Comes of Age" (1995) 42 *Netherlands International Law Review* 1 at 15.

⁴⁹ Van Heijsbergen, *supra* n 44 at 51-2.

⁵⁰ C. Cameron, "The Strengths and Weaknesses of the World Heritage Convention" (1992) 28(3) *Nature & Resources* 18 at 20.

of preservation, only such change as is needed to facilitate presentation of a site to the public,⁵¹ or one which permits more commercial utilisation.⁵²

In fact it is submitted that the direction in which the convention appears to be moving on the level of permitted change is more sophisticated. The listing process of Gough Island was an early signal of these modern developments. In relation to this island, the UK government was called upon to operate the local fishery in a sustainable manner and so as to respect the island's world heritage values. This suggested that yields from the nearby fisheries needed to be calculated on the additional basis of maintaining world heritage values of the entire island (e.g. to support the sea bird populations), and not just maintaining the marine resources themselves.⁵³ In 2005 such a stance received more general support when the Guidelines stated:

World Heritage Properties may support a variety of ongoing and proposed uses that are ecologically and culturally sustainable. The State Party and partners must ensure that such sustainable use does not adversely impact the outstanding universal value, integrity and/or authenticity of the property.⁵⁴

Unlike other MEAs, where more detailed guidance has been produced to assist managers and state parties to meet their obligations, it has only recently been

⁵¹ See D. J. Haigh, *supra* n. 24.

⁵² J. Thorsell, "Human Use of World Heritage Sites. A Global Overview" (1997) 7(2) *Parks* 3 at 3: "Listing does not preclude extractive use". Such extraction is permitted within the Great Barrier Reef World Heritage Site in zones permitting sport fishing, for example.

⁵³ Compare recommendations of the Bureau and the decision of the Committee from the 19th Session of the World Heritage Bureau, July 1995, at para VII.2(c) and the 19th Ordinary Session of the World Heritage Committee, December 1995, at para VIII.4(A.1) where sustainable use is specifically qualified by inserting a reference to World Heritage values. And see further J. Thorsell, *ibid* at 3.

⁵⁴ Guidelines para 119.

suggested that such guidance should be produced under the World Heritage Convention.⁵⁵ It is therefore of great importance for the regime to build upon the developments of 2005 and draft detailed clarification on the level of change which is, or is not, permitted under the terms of Article 4 and 5. This would allow countries to feel secure in the knowledge that objective judgments can be made on the conduct of contracting parties. In addition, states will also then be in a better position to resolve the “*vexed question of conservation versus development*”, when the need to develop roads or mining industries arises.⁵⁶

If the issues mentioned earlier with respect to identifying heritage properties are recalled, the serious weaknesses relating to the regime’s obligations as set out in Articles 4 to 6 can be recognised. The above analysis of two fundamental questions on these articles has highlighted that there is uncertainty about which coral reef properties currently fall under the convention (although, as far as possible, an attempt will be made later), and uncertainty about the level of change permitted as a result of human activities within those areas which do fall within the agreement’s jurisdiction.

2.6 THE WORLD HERITAGE FUND

Writing at a time when establishing funding streams was rarely given due consideration under MEAs, Lyster duly highlighted the existence of the World Heritage Fund as one of the convention’s key features.⁵⁷ Even today, the importance of the fund remains, playing as it does an integral role in the careful balance of benefit and burden offered under the regime.

⁵⁵ 25th Ordinary Session of the World Heritage Committee, para III.14.

⁵⁶ Atherton, *supra* n. 33 at 642.

⁵⁷ Lyster, *supra* n. 2 at 229.

The majority of the fund is constituted from money collected through compulsory and voluntary contributions from the state parties, supplemented by gifts from other states,⁵⁸ private parties or UNEP bodies, and cash from fund raising activities. The contributions of the contracting parties are compulsory under Article 16(1) except where a party declares at the time of ratification, accession or acceptance, that it shall not be bound by that obligation.⁵⁹ However, where such a declaration has been made, the relevant state party is still expected to make 'voluntary' contributions equivalent to those they would have made had no declaration been made, and on a regular basis at least every two years.⁶⁰ This approach was agreed upon during the drafting process to ease the passage of the convention through some national systems in which ratification would have been difficult for an agreement containing obligatory financial commitments.⁶¹ In practice equal pressure is brought to bear on states which are late making their payments, regardless of whether they have made a declaration or not.⁶²

The amounts due have always been set at 1% of a state's regular contributions to the budget of UNESCO, which is in turn set according to a scale where the developed states pay more. Whilst the operating budget for the years 2004-2005 accordingly stands at US\$7 million, difficulties have arisen in the past from low funds. Sometimes this has been because of delays in payments, as happened in 1983.⁶³ At other times,

⁵⁸ Austria made a number of voluntary contributions before becoming a state party.

⁵⁹ WHC Article 16(2).

⁶⁰ WHC Article 16(4).

⁶¹ Lyster, *supra* n. 2 at 230.

⁶² See, for example, 8th Ordinary Session of the World Heritage Committee, paras 28-31.

⁶³ 7th Session of the Bureau to the World Heritage Convention. Such previous delays may have been linked to the conflict between UNESCO, and the USA and the UK, which resulted in the two states withdrawing from the organisation but not from the convention.

inadequate funds have been available as a result of low membership of industrialised countries who offer financial (and technical) resources whilst not requesting aid themselves. In 2001 efforts were made to increase the current 1% level of contribution to increase the level of funds in hand for what is, after all, regarded within UNESCO as one of its blue riband initiatives.⁶⁴ Whilst such moves have so far proved unsuccessful, with regard to the importance of this issue, it is worth noting Eidsvik's comment made in 1990 when the previous year's funds had stood at US\$2.5 million:

Why is it that in the early 60's UNESCO could raise \$42 million to protect Abu Simbel, Borobudur or the Citadel and Sans Souci in Haiti? Today we fail to attract 1% of state's contributions to UNESCO's budget.⁶⁵

The purpose of the fund is to support applications made by state parties for assistance under Article 13(1). Such applications may be made in respect of listed sites or those which will potentially be included in either the World Heritage List or the Danger List. The assistance granted may support preparatory measures (such as preparing tentative lists), training, technical help and emergency action where sites have or are in imminent danger of damage due to sudden or unexpected phenomena.

Applications are submitted through the convention's secretariat to the World Heritage Committee for its consideration, with agreements concluded in order to formalise arrangements for successful proposals.⁶⁶ Priority is given to emergency assistance, followed jointly by preparatory and technical assistance. Further, only part of the

⁶⁴ 25th Session of the Bureau to the World Heritage Convention, para X.2 and Annex XII.

⁶⁵ Eidsvik, *supra* n. 3 at 17.

⁶⁶ WHC Article 26.

costs of the assistance requested should be provided by the international community through the fund, with the majority coming from the state party concerned unless their resources do not permit this.⁶⁷

In the penultimate section to this chapter, it will be shown how the World Heritage Fund has directly supported coral reefs and MPAs. At this stage it is simply worth noting that access to assistance through the fund represents a significant incentive for developing states (in whose territories coral reefs are mostly found) to seek inscription of properties in the World Heritage List. Assistance they receive is likely to be greater in value than the contribution they are expected to make to the fund. In turn, developed states, upon whom the main burden of sustaining the fund falls, are assured that the distribution of support is conducted in an independent and transparent manner by the elected committee of the convention to support the world's heritage. The World Heritage Fund therefore plays a key role in the successful operation of the regime.

2.7 ADMINISTRATIVE ARRANGEMENTS UNDER THE WORLD HERITAGE CONVENTION

If the World Heritage List, Danger List and World Heritage Fund are to be regarded as central pillars to the operation of the convention, the World Heritage Committee is the final such pillar in the regime. This body of 21 elected state parties is the administrative body to whom much of the power under the agreement has been delegated, for it is only with the approval of the Committee that, firstly, a property can be inscribed on the two lists, and, secondly, a state can receive assistance through technical co-operation and the fund. It is also the Committee which determines many

⁶⁷ WHC Article 25.

of the programmes and strategies for the operation of the convention. For example, the Guidelines are produced under the Committee's auspices.

This degree of delegated power to a body operating outside of conferences of all of the contracting parties to a convention is in contrast to other MEAs. Under the World Heritage Convention, such meetings of all contracting parties do still occur (every two years during UNESCO General Conferences) but these separate General Assemblies are principally concerned with setting the level of contributions to the fund, and electing new members to the Committee. Such a distinctive delegation of power was recognised by the legal advisor to UNESCO in 2000 when he noted that:

the World Heritage Convention is different from many other international Conventions in that all the substantive powers are designated to the Committee and not to the General Assembly. The Committee can transfer powers to the General Assembly.⁶⁸

This division of power suggests that securing a position on the Committee would be particularly advantageous, even if the earlier practice of advocating for the inscription of your own national properties on to the World Heritage List, or for your own assistance requests, during ordinary sessions of the Committee is now condemned as against the accepted etiquette.⁶⁹

In 2000, internally produced figures prepared by Belgium suggested a possible consequence of Committee membership. Belgium presented figures showing that 95 contracting parties had never been represented on the Committee, whilst 10 had been elected more than three times. A possible effect of this was that those states which

⁶⁸ 24th Session of the Bureau to the World Heritage Convention, VI.7(1.1).

⁶⁹ Committee Rules of Procedure, Rule 22.4.

had not been on the Committee had few, if any, sites on the World Heritage List, whilst the opposite was true for those who had enjoyed multiple terms of office.⁷⁰ Establishing the precise reasons for this correlation is difficult. It could be speculated that this might be due to the extra attention and priority the convention receives at the national level during a state's term of office, rather than suggesting favouritism in inscribing representative's properties. However, the World Heritage Committee has not spent time and resources trying to understand this phenomenon, but has simply taken a number of steps (described below) aimed at bringing about a better rotation of states through Committee positions.

Ensuring this rotation has proved somewhat difficult, despite Article 8(2) of the agreement stating that:

Election of members of the Committee shall ensure an equitable representation of the different regions and cultures of the world.

Increasing the permitted number of states on the Committee is widely believed to be an impractical solution as the limit of 21 is set by Article 8(1) of the convention and would consequently require formal amendment. Therefore a number of alternative approaches have been adopted. First, voluntarily abstaining from seeking re-election at the end of a six year term has been frequently promoted, as encapsulated in the resolution of the General Assembly in 1989.⁷¹ Since then, more significant changes

⁷⁰ *Supra* n. 68, para VI.7(5).

⁷¹ 7th General Assembly, Summary Record, para 12. Such moves however have proved unsuccessful with a number of states ignoring the resolution, for example, the USA in 1991, and China, Egypt, Mexico and Spain in 1997.

have been introduced whereby one seat is reserved on the Committee for a state with no property listed on the World Heritage List.⁷²

Rotation of Committee positions otherwise takes place in accordance with Article 9. The term of office for a state member of the Committee starts after the ordinary session of the General Conference at which they were elected, and, except where voluntarily foreshortened, terminates at the end of the 3rd subsequent biennial ordinary session, i.e. after six years. Elections are, however, held at every ordinary session since the convention has been drafted to ensure that these sessions coincide with the ending of terms of office for seven states.⁷³

As seen in the records of proceedings, the Committee's work load at any given ordinary session generally comprises adjudicating upon nominations to the World Heritage List and World Heritage in Danger List, monitoring the state of conservation of such listed sites, and steering the implementation of the convention. The role of listing has been considered in some detail already, but monitoring and future development have increasingly become more important and formalised.

Monitoring under the World Heritage Convention now takes two forms, which can be generally classified as reactive and institutional. Reactive monitoring for natural properties predominantly takes the form of reports by IUCN on specific dangers to world heritage sites; IUCN being the competent advisory body to the convention on natural heritage.⁷⁴ In the light of these reports, the Committee has proved itself to be particularly pro-active in seeking dialogue with, requesting information from and

⁷² This was first put into practice at the 13th General Assembly.

⁷³ WHC Article 9(2).

⁷⁴ As envisaged in the Guidelines, paras 169-176. Reactive monitoring is the term also used under the regime.

demanding action by the states involved. This pro-active approach is made possible by a number of factors already mentioned, such as the high profile of world heritage listing which encourages states to be seen to be doing the right thing, and the desire of states to be co-operative towards the body which holds the key to the advantages consequent to inscription. As such, therefore, reactive monitoring under the convention has proved to be particularly important, and examples of its role in conserving coral reef protected areas will be explored in detail towards the end of this chapter.

Since 1982, however, the World Heritage Committee has also sought to introduce more systematic forms of monitoring, although this initially met with much resistance.⁷⁵ The Committee's wishes were, however, finally satisfied in 1999.⁷⁶ In its current form, what could be termed institutional monitoring under the World Heritage Convention should involve both national measures (frequent and regular monitoring of individual sites by managers, with the information acquired in turn collected and processed by a centralised body at the national level),⁷⁷ and periodic reports to the international community by governments, in part based upon the national monitoring data. These latter reports are gathered on a regional basis⁷⁸ and have so far been prepared for the Latin American, Arabic, Asian and African contracting parties.

The Committee's work in determining the future development of the convention has also grown in recent years, and often receives particular attention in conjunction with anniversaries of the agreement's adoption. Thus in 1992, a number of "Strategic

⁷⁵ See debates at the 10th General Assembly in 1995.

⁷⁶ 11th General Assembly, Summary Record, paras 22-25.

⁷⁷ 17th Ordinary Session of the World Heritage Committee, para IX.2.

⁷⁸ Guidelines, para 203.

Orientations” were adopted to guide future work under the treaty. Five goals were identified under this plan:

- 1) complete identification of the world’s heritage through studies of the current list leading to identification of gaps;
- 2) ensure the continued representativeness and credibility of the World Heritage List;
- 3) promote adequate management and protection of World Heritage Sites;
- 4) pursue more systematic monitoring of properties; and
- 5) increase public awareness and involvement in world heritage issues.

Significant steps were made towards meeting these goals, such as the introduction of the monitoring mechanisms and rotation of Committee members already mentioned. More recently, the work programme has been reformulated and updated as set out in the 2002 “Budapest Declaration on World Heritage”.⁷⁹ This has focused upon four strategic objectives including, once again, public awareness and involvement, and producing a credible and representative World Heritage List. The remaining two objectives seek to build capacity within state parties and to ensure the effective conservation of world heritage sites.

The World Heritage Committee’s workload is therefore quite varied. It has also grown over the years since the convention became operative and more states have become contracting parties seeking to benefit from the recognition of their cultural and natural heritage. This growing workload has demanded the introduction of measures to ensure that the review of nominations to the World Heritage List does not

⁷⁹ 26th Ordinary Session of the World Heritage Committee, Decision 26 Com 9.

assume such proportions that this exercise is at the expense of monitoring listed sites and steering the future development of the treaty. To this end, at their meeting in Cairns at the end of 2000 the World Heritage Committee adopted a new 16-month timetable for adjudicating on nominations together with limits on the number of nominations which would be considered in any given year. These annual limits were set at considering only 30 nominations, with states allowed one nomination each with the exception of those who had no listed properties, who could nominate two. Where more than 30 nominations were still received, priority was given to states with no listed properties, followed by under-represented categories of cultural and natural heritage.⁸⁰

The Cairns Decision of 2000 has since proved controversial and frequently opened up for criticism at Committee meetings.⁸¹ This is despite the decision's worthy aims of improving the quality of nomination reviews and allowing the Committee to focus upon implementation of the convention, instead of simply becoming a listing mechanism. As a compromise, the Cairns approach has often been re-confirmed with minor amendments. For instance, for its 30th session due to take place in 2006, the Committee has agreed, on an experimental basis, to consider 45 nominations as per the Cairns priorities, but with two nominations per state allowed provided one concerns natural heritage.⁸²

Just as important in managing and enhancing the Committee's work are the Bureau to the World Heritage Committee, the secretariat and the role played by IUCN in relation to natural heritage. The Bureau is a sub-Committee of the World Heritage

⁸⁰ 24th Ordinary Session of the World Heritage Committee, para VI.2(3).

⁸¹ See records of the 25th and 26th Ordinary Sessions of the World Heritage Committee.

⁸² Guidelines para 61.

Committee, comprising seven state party Committee members.⁸³ It meets in advance of ordinary sessions of the Committee in order to co-ordinate the latter's work – a task which takes on a wide variety of forms including adopting the agenda, reviewing state of conservation reports on heritage properties and making recommendations to the Committee on whether to inscribe, reject or defer nominations.⁸⁴ This latter function may be significant as the records could indicate a tendency of the Committee to follow the majority of these recommendations,⁸⁵ although that is not to deny that the ultimate power to inscribe still lies with the Committee itself. The Bureau makes such recommendations, in relation to natural properties, having first reviewed the nomination documents and recommendations made by IUCN.

With no scientific committee appointed under the convention, the role of competent advisory authority on natural heritage has fallen to IUCN, placing the non-governmental organisation in a position of considerable importance within the world heritage regime. This role is formally recognised in both the treaty⁸⁶ and the Guidelines, and in one of its most important forms deals with the preparation of evaluation reports for the Committee on nominated properties. These evaluation reports judge a property, in the light of site visits and due consideration of application documents, against the published criteria and conditions of integrity which were described earlier. The reports are particularly influential in the decisions of the

⁸³ Bureau was originally formed under the rules of procedure for the World Heritage Committee adopted at the 1st Ordinary Session of the World Heritage Committee, in 1977.

⁸⁴ Committee Rules of Procedure, Rule 12.1, available online at www.whc.unesco.org.

⁸⁵ This is an area requiring further research which, unfortunately, is outside of the scope of this current thesis.

⁸⁶ See for example WHC Articles 8(3) and 14(2).

Bureau and Committee as to listing; an understandable consequence perhaps of IUCN's position as the sole scientific and technical advisory body to the regime.

IUCN has also contributed to the Committee's other work, for example assisting with the production of shadow lists of world heritage which help to guide contracting states in selecting suitable properties for nomination and to improve the representativeness of the List itself. Further, the Committee and Bureau have been receptive of and supportive towards IUCN's efforts to provide reactive monitoring for world heritage sites. To this end it is now an accepted part of the Committee's agenda that short reports are presented by IUCN on the status of sites facing particular threats or danger. IUCN is particularly well equipped to produce such reports (as the organisation pointed out in 1985) given the input from over 4,000 voluntary correspondents located in 126 states.⁸⁷ The influence and importance of IUCN in the affairs of the World Heritage Committee is clearly, therefore, very significant.

The Committee and the convention in general are also supported and served by a secretariat provided by UNESCO in accordance with the requirements of Article 14. In 1992, two previously separate divisions of UNESCO which dealt with cultural and natural heritage were combined under the auspices of the World Heritage Centre in order to provide administrative support for the Committee, as well as to promote public awareness of the convention and assist with fund raising initiatives such as the production of publications.

The administrative structure of the World Heritage Convention is therefore distinct from other MEAs considered in this study in a number of respects. First, as the legal advisor noted, the substantive powers under the treaty lie with a small elected group

⁸⁷ 9th Ordinary Session of the World Heritage Committee, para 16.

of member states, rather than with the general conference of all contracting parties. Second, the influence of IUCN is particularly strong through its role in the nomination process and reactive monitoring. This influence was originally provided for in the convention's drafting and is partly the result of the absence of a scientific committee. Given IUCN's expertise in the field, this should not cause undue concerns as to the scientific underpinnings of the agreement from a coral reef point of view.

2.8 SUMMARY

The analysis of the World Heritage Convention has highlighted how MPAs play an integral role in the listing process and that some coral reef ecosystems fall within the jurisdiction of the convention through the definition of natural heritage. Central to the philosophy of the regime are the substantial incentives on offer to state parties who have properties inscribed on the World Heritage List. These incentives, as will be seen in later sections, enable the regime to be more interventionist in monitoring the protection and conservation of natural heritage.

This analysis has, however, revealed that the regime has only recently made concerted efforts to move beyond conducting a listing exercise. Systematic monitoring is in its infancy and gaps exist in guidelines on issues such as the protection and conservation obligations. Most significantly, however, the convention applies to a fraction of the coral reefs in the world on account of the definition of natural heritage, which seeks to limit the agreement's operation to the most universally outstanding examples.

3. GEOGRAPHIC COVERAGE

From the perspective of assessing the World Heritage Convention and its role in promoting the conservation of coral reef ecosystems through MPAs, one significant

aspect demanding consideration is the number of states which are contracting parties and in whose territory these habitats are located.

The World Heritage Convention is subject to ratification or acceptance by states who are members of UNESCO.⁸⁸ Non-member states may also be invited to accede by the General Conference of UNESCO.⁸⁹ In accordance with these rules, to date, 73 of the 83 coral reef states identified in Appendix I to this study have become contracting parties.

States such as Australia, France, the United States of America and the United Kingdom, were early members of the convention. Ratification and accession by Asian and Pacific Island countries such as Indonesia, the Philippines and Papua New Guinea has come much later.⁹⁰ The reasons for this are likely to be varied. For example, the World Heritage Convention has sometimes been perceived as focused upon recognising western monumental ideals of heritage, and therefore of little relevance in states without a history of monument building. Other factors noted by Vernhes may also have influenced the slow acceptance by Asian and Pacific Island nations. These range from the local focus upon an alternative regional mechanism devised in 1978 for heritage parks and reserves within the Association of Southeast Asian Nations system, to the lack of a centralised protected area culture in Pacific

⁸⁸ WHC Article 31(1).

⁸⁹ WHC Article 32(1).

⁹⁰ Note, for example, the concern expressed at the 9th Ordinary Session of the World Heritage Committee in 1985 of the poor representation of Asian States despite the Philippines recently becoming a member.

Islands where traditional forms of land tenure still predominate.⁹¹ Today, however, membership in these areas of importance to coral reefs is good.

Based upon UNEP's figures from 2001,⁹² the World Heritage Convention would appear to exercise jurisdiction over 97.37% of the world's coral reefs. In comparison to the equivalent assessments for the other MEAs being considered in this study, this figure is particularly high. However, such bald figures are a little misleading if taken out of context.

As has already been noted, the definition of natural heritage is inherently exclusive, only offering protection and conservation under the agreement to coral reefs of outstanding universal value as recognised by contracting parties. Therefore unlike other treaties included in this study, such as Ramsar or the CBD, the World Heritage Convention does not, nor is it intended to, apply to the 97.37% of coral reefs within the jurisdiction of current state parties. It is therefore difficult to directly compare this figure with other MEAs which promote the conservation of coral reef ecosystems through MPA strategies.

The true strength of the current position is truly appreciated, however, when it is recalled that global studies aimed at identifying gaps in the World Heritage List are an important and ongoing exercise under the convention. Any coral reef site identified as being a key example of natural heritage but which has not yet been inscribed in the World Heritage List (or included in a tentative list) is now more likely to be situated within the territory of a contracting party. This is particularly so

⁹¹ Vernhes, *supra* n. 33 at 23-24.

⁹² "New Atlas Maps the World's Fast Disappearing Coral Reefs", *UNEP-WCWC Press Release*, 11 September 2001.

given the membership of key states in South-East Asia where coral reef diversity and instances of species endemism are at their highest.

Geographic coverage of the World Heritage Convention is therefore particularly enabling for the regime's objects and purposes, especially for including examples of coral reef natural heritage. However, this coverage is limited by the definition of natural heritage which excludes from the regime's protection and conservation obligations many of the coral reefs found in state parties. In assessing the role that the convention therefore plays in promoting the conservation of coral reefs through MPAs, the importance of promoting the nomination of coral reefs and the actual number of coral reefs inscribed on the World Heritage List, assumes far greater importance.

4. PROMOTING THE CONSERVATION OF CORAL REEF ECOSYSTEMS UNDER THE CONVENTION

Promoting the protection and conservation of the most universally outstanding examples of coral reef ecosystems, particularly through their nomination and inscription on the World Heritage List, has in the main been subsumed within the broader concern of balancing the protection and conservation of both natural and cultural heritage. Some initiatives have recently focused upon coral reefs, and these will be discussed in the second half of this section. However, initial consideration must go to the overarching problem of ensuring that natural heritage receives as much recognition from states as their cultural heritage.

The Guidelines state that as a general principle, efforts should be made to maintain a reasonable balance between the number of cultural and natural heritage properties entered on the World Heritage List.⁹³ Whether this is being achieved has been a regular debate at meetings convened under the convention. As early as the 1979 round of nominations, the fact that only 17 of the 89 nominations being considered were natural properties raised concerns about this becoming a future long term issue. 13 years later, only one in four listed sites represented natural heritage⁹⁴ whilst today the figure is nearer one in five.

A number of reasons have been proposed for this state of affairs. It has been said that managers of cultural properties are much more aware of the World Heritage Convention than their natural property counter-parts, and this might be linked to the fact that UNESCO is more suited to reaching government ministers responsible for education and culture than environmental departments.⁹⁵ It has also been suggested that the focus upon listing cultural heritage is a result of the lack of any other international framework for recognising this type of heritage, whilst MEAs such as the Ramsar Convention and extra-legal programmes of action like UNESCO's Man and the Biosphere Programme, offer alternative avenues for such recognition in the natural sphere.⁹⁶

Ultimately, however, it is often remarked that a simple numerical comparison is misleading. First, such an analysis fails to reflect the fact that natural properties are

⁹³ Guidelines para 57.

⁹⁴ J. Thorsell, "From Strength to Strength: World Heritage in its 20th Year" in *World Heritage Twenty Years Later. IVth World Congress on National Parks and Protected Areas* (IUCN) (1992) 19 at 22.

⁹⁵ Eidsvik, *supra* n. 3 at 17-18.

⁹⁶ *Report of the World Heritage Global Strategy Natural and Cultural Heritage Experts Meeting*, 25 to 29 March 1998, Amsterdam at 15.

far larger in area than cultural. Secondly, the aim is to produce a list which is representative of natural properties regardless of developments on the cultural side.⁹⁷ Ensuring the correct sites are identified, nominated and assessed against a global strategy which reflects the needs of the list in order to become more representative of the earth's natural heritage is the real priority.

Given the above, the tentative lists which states are supposed to produce and file with the convention secretariat become especially important since they can be used as a planning tool by the World Heritage Committee to identify potential gaps in the types of property which are represented on the World Heritage List. Indeed, the inclusion of a property on a duly submitted tentative list has, since 1984, been a pre-condition for the nomination and inscription of cultural properties.⁹⁸ Such a pre-condition did not exist for natural properties until 2000.⁹⁹ This former approach may have reflected a desire to make it as easy as possible for states to nominate natural properties at a time when numerical comparisons still seemed to be the yard-stick for progress. However, the new approach provides the regime with better means to assess the current constitution of the list from a natural heritage perspective, and plan for its future development. Further, as was discussed at the start of this chapter, the protection and conservation of natural sites outside of the listing mechanism is dependent upon the identification and recognition by a contracting party of a given property as meeting the Article 2 definition of natural heritage. The problem of finding due evidence of such recognition was touched upon, but, as was suggested, the production of tentative

⁹⁷ *Report of the Expert Meeting on Evaluation of General Principles and Criteria for Nominations of Natural World Heritage Sites*, Parc national de la Vanoise, France, 22 to 24 March 1996, section 4.

⁹⁸ 7th Ordinary Session of the World Heritage Committee, para 18.

⁹⁹ 24th Ordinary Session of the World Heritage Committee, part VI(2) (3.2).

lists appeared to be strong evidence of this. The current rules can therefore influence the application of the convention's provisions for non-listed examples of natural heritage.

Of the tentative lists which had been submitted in May 2005, 53 have been submitted by the coral reef states identified in Appendix I as contracting parties to the agreement. Of the 20 which have not submitted a list, a number are significant in terms of the area of coral reef within their jurisdiction. For example, Jamaica as the fourth most significant state in terms of coral reef area in the Caribbean, has not submitted a tentative list. Nor has Papua New Guinea, in whose territory lies almost 5% of global coral reefs. The cumulative significance of the various missing lists is that approximately 19% of the globe's coral reefs could not be nominated for the World Heritage List under the current rules. The first step towards promoting the protection and conservation of coral reefs therefore lies in supporting states in the production of tentative lists.

Related to this is the requirement that the relevant contracting parties should be able to identify those coral reefs which are of outstanding value and to encourage these states to include such sites in their tentative lists. Progress by states in this regard is varied. For example, Egypt, France, the Philippines, Brazil and Cuba have not only produced extensive tentative lists of both cultural and natural heritage, but have also included coral reef sites in their lists. Others, such as Myanmar and Jordan, list only cultural properties in fairly extensive lists.

Apparent shortcomings may therefore need to be checked by the regime against an inventory of their own drafting of coral reefs which are independently believed to be of outstanding value. To this latter end, the recent World Heritage Marine Workshop held in Hanoi, from 25 February to 1 March 2002 has made significant progress.

Organised by the World Heritage Centre together with IUCN and the US National Oceanic and Atmospheric Administration, and with funding provided by the United Nations Foundation, the workshop was attended by 62 coastal and marine science experts.¹⁰⁰ The principal aim of the 2002 workshop was to remedy the gaps in the World Heritage List of tropical coastal, marine and small island ecosystems (such as coral reefs) through developing by consensus a scientifically based inventory of potential properties for the list. As the workshop recognised, this would be the first major step in expanding coverage of these marine ecosystems, thus thereby increasing conservation of these significant areas.¹⁰¹ The workshop also looked to see if opportunities existed for multi-site nominations in this area i.e. either transboundary or serial. A regional analysis was used and three lists of properties were drawn up as follows:

List A: areas the experts unanimously agreed were of outstanding universal value and which should as a matter of high priority be considered by state parties for nomination;

List B: areas identified as having significant components of outstanding universal value which state parties together with experts should further investigate through studies in order to prepare appropriate nominations;

List C: areas for which inadequate information was available but which the experts felt may be of outstanding universal value. States should therefore conduct further studies together with experts.

¹⁰⁰ A. Hillary, M. Kokkonen and L. Max (Eds), *World Heritage Papers No. 4 - Proceedings of the World Heritage Marine Biodiversity Workshop* (UNESCO) (2003) at 17.

¹⁰¹ *Ibid.* at 27.

At least 27 sites are included in List A which include coral reef ecosystems as part of the site's outstanding universal value. These sites are spread over all areas except the Central Indian Ocean Region. The latter region could not initially be covered at the meeting due to lack of expertise for this area amongst those attending the workshop. A subsequent report was produced, however, in relation to the Central Indian Ocean detailing a further six sites containing coral reefs and thought to have elements of outstanding universal value. Lists B and C from both studies also include some notable coral reefs, such as Manado in Indonesia (List B), and the UK's Chagos Archipelago (List C).

Unlike tentative lists, the experts' report has no apparent legal implications under the convention – indeed some sites which were included are located in territories of non-contracting parties, such as Equatorial Guinea. However, the value of the experts' work lies in having produced a shadow list of properties which are important from a coral reef point of view, which in turn can help IUCN recognise current gaps in the World Heritage List, focus the convention's resources to promote the nomination of these areas and assist state parties in determining suitable sites for nomination which are likely to be accepted (thereby ensuring efficient use of resources in the nomination process). Of course, the list can also bring some pressure to bear upon countries to nominate these sites, in a similar manner to IUCN's more wide ranging inventory of the world's most outstanding natural sites drawn up in the early 1980's.¹⁰²

The experts' report of 2002, commonly referred to as the Hanoi Statement, is therefore the most significant instance of promotion of coral reef ecosystems of recent years, albeit as part of promoting the protection and conservation of tropical marine

¹⁰² *Supra* n. 20.

ecosystems. However, other more discrete instances of promoting coral reef conservation should also be noted. For example, as a matter of record, in 1998 the World Heritage Committee encouraged state parties to nominate such marine ecosystems.¹⁰³ More significantly, and perhaps less obvious on its face, was the recognition that forms of customary land tenure could satisfy the integrity requirements, despite the restrictions such systems place upon the powers of state governments. Customary land tenure issues had arisen in relation to the nomination of East Rennell by the Solomon Islands. This nomination led to Thailand voicing concerns as to whether the legal and management elements of the integrity conditions could be met if the proposing government lacked the central powers to enforce such conditions.¹⁰⁴ However, such forms of land tenure were duly felt to be acceptable and the Guidelines were amended accordingly. Such moves are significant for promoting the protection and conservation of coral reefs when one recalls that many significant reef systems are located in Pacific island states where such forms of land tenure exist.

The promotion of coral reef issues under the World Heritage Convention has historically been tied into the general issue of balancing the protection and conservation of natural and cultural heritage. As part of that ongoing issue, the importance of tentative lists needs to be recognised and it is here that recent developments focusing upon tropical marine ecosystems have offered the greatest potential for promoting coral reefs under the convention. The next section will focus upon the actual listing of coral reef areas as World Heritage Sites and, to the extent

¹⁰³ 22nd Ordinary Session of the World Heritage Committee, para VII.27.

¹⁰⁴ See the discussions at the 22nd Meeting of the World Heritage Bureau and the 22nd Ordinary Session of the World Heritage Convention.

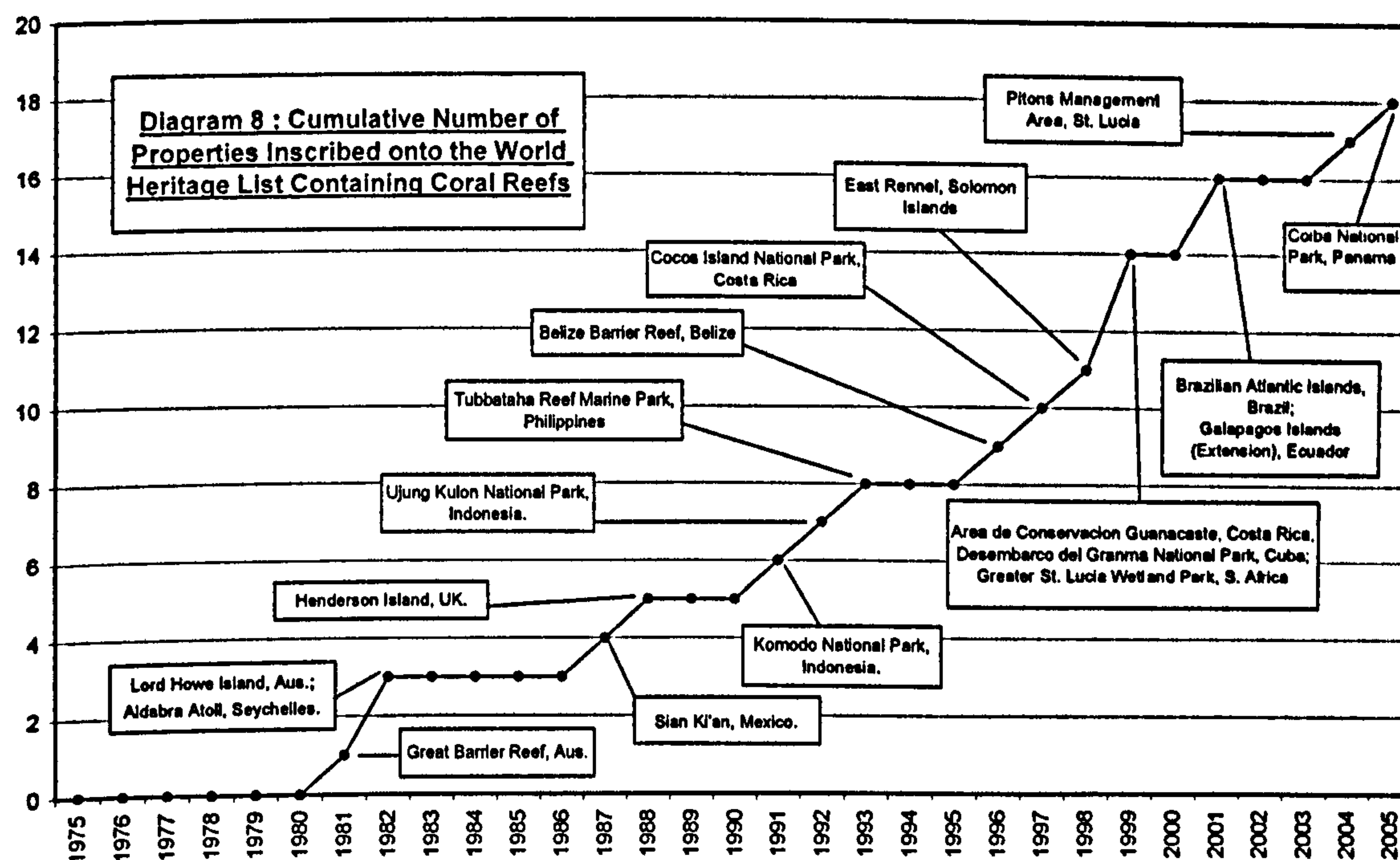
possible after such a short time period, try to form preliminary views on the success of the Hanoi Statement.

5. LISTING OF CORAL REEFS AS WORLD HERITAGE SITES

The significance of inscription onto the World Heritage List for coral reef sites has been evident from the beginning of this chapter. Such importance flows from the benefits and status offered by the regime to these sites as well as the obligations of the contracting parties which attach to these properties and which are increasingly being rigorously monitored by the convention. The previous section also noted how, until 2002, the promotion of protecting and conserving coral reefs has to a degree been subsumed within the wider issue of balancing the representation of natural and cultural heritage. This study must therefore now assess how many areas of coral reef have been inscribed onto the World Heritage List, how many have been entered onto the World Heritage in Danger List and try to establish whether future nominations of coral reefs sites are imminent.

In November 2002 Salvat, Haapkylä and Schrimm produced an inventory of coral reef protected areas under two MEAs - the Ramsar Convention and the World Heritage Convention. 15 sites were noted for the latter in comparison to Ramsar's 25.¹⁰⁵ Since then the number has increased to 18. The identity and inscription over time of these World Heritage sites is represented in Diagram 8 below. A number of points can initially be made from these facts.

¹⁰⁵ B. Salvat, J. Haapkylä and M. Schrimm, *Coral Reef Protected Areas in International Instruments* (CRIOBE-EPHE) (2002).



First, the coral reefs found within each property may be the principal feature making the area worthy of listing as a World Heritage Site. For example, Tubbataha Reef in the Philippines was inscribed on account of being “*one of the outstanding reefs in the region*”¹⁰⁶ whilst the Belize Barrier Reef was inscribed “*as the largest barrier reef in the Northern hemisphere*”.¹⁰⁷ Alternatively, the coral reefs may be just one of a number of habitats occurring over a larger property which collectively merit recognition under the convention. For example, Greater St Lucia Wetland Park in South Africa was inscribed as an estuarine ecosystem, whilst Aldabra Atoll in the Seychelles is as significant for its terrestrial fauna and flora as for its marine ecosystems, such as mangroves and coral reefs.¹⁰⁸

¹⁰⁶ 17th Ordinary Session of the World Heritage Committee, para. XI.1.

¹⁰⁷ 20th Ordinary Session of the World Heritage Committee, para VII.4

¹⁰⁸ Information taken from Salvat *et al*, *supra* n. 105 at 48 and 55.

Second, other sites have had marine areas either added or extended subsequently to their inscription. Thus, the Galapagos National Park was originally inscribed in 1978 but the marine reserve area – which had outstanding universal value in its own right – was not added to the World Heritage listing until 2001. Further, Komodo Island World Heritage Site was extended in 2001 to reflect the coral reef values in the adjacent areas.

Diagram 8 must therefore be read against this backdrop, remembering that sites so far listed reflect varying situations as to the significance of the coral reef ecosystem, and the proportion of reef to other habitat, present therein. This situation is, of course, similar to that encountered in relation to wetlands of international importance under the Ramsar Convention on Wetlands.

Finally, it is apparent that there are far fewer coral reef sites listed under the World Heritage Convention in comparison to the other main MEA which employs listing as a mechanism, namely the Ramsar Convention on Wetlands. Currently 54 internationally important wetlands listed under Ramsar contain coral reef ecosystems.¹⁰⁹ Of course, such disproportion might ultimately be expected given the intentional exclusivity of the World Heritage Convention. However, the pool of coral reef sites which should be listed under these treaties is far from exhausted, meaning issues of ‘supply’ can hardly account for the varying numbers at this stage. Since both conventions were concluded at around the same time, this suggests that Ramsar is quicker at responding to the need to afford coral reefs international recognition and protection. That ability surely lies in the simplicity of listing under Ramsar, compared to the nomination procedure under the World Heritage Convention. This is not to imply that World Heritage Listing should not be sought, but indicates that if an urgent

¹⁰⁹ See Chapter 8.

need to safeguard a particular coral reef arises, Ramsar offers a faster means to involving the international community, acquiring international recognition and subjecting a site to internationally agreed standards of conservation management. World Heritage listing could then be considered as a follow up move, since the two types of listing are broadly compatible.

Diagram 8 illustrates the number of sites containing coral reef ecosystems which have been included in the World Heritage List. Of course, a second list is also maintained by the World Heritage Committee which identifies those World Heritage Sites which are believed to be in danger because of serious and specific threats. To date, none of the properties identified in Diagram 8 have been inscribed in the World Heritage in Danger List. Reports identifying concerns regarding properties have been presented to the World Heritage Committee and its Bureau, as will be discussed in the following section, but, other than the Galapagos, this has not led to serious discussions about inclusion in the Danger List.

With only 18 properties containing coral reef ecosystems so far inscribed and protected under the agreement as examples of natural world heritage, it is interesting to see if future nominations of similar sites are likely. As was noted in the preceding section, the 2002 Hanoi Statement listed 27 examples of natural sites containing coral reefs which it was unanimously agreed were of outstanding universal value. However, whilst the statement suggests which sites are expected to be included on the list in the future, the most important evidence for identifying future nominations and therefore potential inscriptions lies in the tentative lists of the contracting parties.

Of the 27 sites included in 2002 in the Hanoi Statement "A List", three have been included in tentative lists, as have four elements of some recommended serial and

transboundary sites.¹¹⁰ Panama has now duly nominated and had inscribed the Coiba National Park, whilst the nomination of Egypt's Ras Mohammed – a terrestrial and marine protected area – was deferred in 2003 by the World Heritage Committee so that Egypt could consider extending the nominated area so as to include the marine park elements.¹¹¹ To these properties which have a connection to the Hanoi Statement should be added six further sites included in the tentative lists of state parties and which, depending upon the boundaries set during the nomination process, could potentially include coral reefs.¹¹² Therefore, in total, a further 13 areas of coral reef ecosystem may, within the next 10 years, be nominated for inscription on the World Heritage List. Further, the three sites included in the “A List” should, in principle, receive support subject to the conditions of integrity being met.

Clearly much needs to be done to advance the nomination of the properties identified in 2002 in the Hanoi Statement. The document is an important basis for pursuing the nomination of additional coral reef areas and can only help increase the number of such sites which have been inscribed on the World Heritage List. As matters stand, however, and as is the case for natural properties generally, coral reef ecosystems are under-represented in the List, even more so than under the listing mechanism devised by the Ramsar Convention.

¹¹⁰ The three sites are New Caledonia (France), Southern Cuba Coral Archipelagos (Cuba), and Socotra Archipelago (Yemen). The parts of serial and transboundary sites are, Turtle Islands (Philippines), Ras Mohammed (Egypt), Coiba Island (Panama) and Belhaf Bir Ali (Yemen).

¹¹¹ 27th Ordinary Session of the World Heritage Committee, Decision 27 COM 8C.5.

¹¹² These sites are El Nido Marine Reserve (Philippines), Northern Sierra Madre National Park (Philippines), Reserve Biologique de Atol das Rocas (Brazil), Parque Nacional Natural Ensenada de Utria (Colombia), Parque Nacional del Este (Dominican Republic), and Miskitos Keys (Nicaragua). The last two sites are also identified in “List B” of the Hanoi Statement.

6. PRACTICAL IMPLICATIONS OF THE CONVENTION AND LISTING

FOR CORAL REEF MPAS

This section will explore the ways in which some of the 18 properties inscribed on the World Heritage List and which contain coral reef ecosystems have been considered by, obtained support from, and been monitored by, the regime. Together with other examples from the handling of natural heritage, this exercise demonstrates the practical implications of nominating and listing coral reefs under the World Heritage Convention, and thereby reveals the true value of the treaty to MPAs and these ecosystems. This can be demonstrated in four fields: the implications of reactive monitoring, the influence of the World Heritage Committee, financial and capacity building support and the value of listing within national governance.

The World Heritage Committee has been open to the practice of making demands of state parties whether at the inscription stage of listing a property, or during the ongoing efforts to monitor properties. This pro-active stance, as was suggested earlier, is made possible by a number of factors, namely the high profile (both nationally and internationally) of listing, which encourages states to be seen to be 'doing the right thing', and the desire of states to be co-operative towards the body which controls access to the significant advantages on offer under the World Heritage Convention. However, this pro-active approach is also based upon the strength of, and role afforded to, reactive monitoring as conducted by IUCN for natural heritage. Made possible in large part by their 4,000 volunteers corresponding from 126 countries, the value of IUCN's reactive monitoring is well exemplified by the following case. In 1989, IUCN reported to the World Heritage Bureau that they had become aware of a major highway which the Senegalese Government planned to construct through the Niokolo-Koba National Park (a World Heritage Site) with the

involvement of unnamed development banks. The impact assessments which had been prepared for this project were contradictory. The Bureau determined to write a letter to the Senegalese Government expressing their preference for an alternative route outside of the park.¹¹³ As a result of this, and having alerted the World Bank (which was identified as being involved in the project) to the concerns and the inadequacies in the existing assessments, an independent impact assessment was conducted of the two proposed routes which, whilst recommending the original plan of a road through the park (since both routes would affect the integrity of the park), identified many safeguards that needed to be implemented.¹¹⁴

Niokolo-Koba National Park demonstrates how the Committee's pro-active stance is often based upon the quality of IUCN's reactive monitoring work. This approach to monitoring properties, and the respect which the World Heritage Committee is accorded by state parties, is also amply demonstrated by reference to properties containing coral reefs which were identified in the previous section.

In 1985, the Bureau on behalf of the Committee expressed its concerns over siltation problems which were being reported as a result of road construction in the Great Barrier Reef area. Australia immediately responded at the following full Committee meeting by stating that a three year scientific study costing US\$1 million would be conducted into the short and long-term effects of the road on the reefs in question.¹¹⁵

In another example, IUCN reported in 1999 that Komodo National Park in Indonesia was subject to increases in illegal dynamite and cyanide fishing causing damage to the coral reefs in the World Heritage Site, despite support being provided for the

¹¹³ 13th Session of the Bureau to the World Heritage Committee, para. IV.11 (B.4).

¹¹⁴ 15th Session of the Bureau to the World Heritage Committee, para. 45.

¹¹⁵ 9th Ordinary Session of the World Heritage Committee, para. XIII. 37(C).

purchase of patrol boats and training of staff in MPA management through a visit to Queensland, Australia. The Bureau requested that Indonesia permit a monitoring mission to be given access to the park in order to assess the damage and to review current management of the site.¹¹⁶ Whilst the Indonesian government initially proposed sending their own mission to study the problem (the World Heritage Committee responded by requesting that their findings be forwarded to them), a joint IUCN/UNESCO mission was, in fact, given access to the park to conduct their own assessment. This visit revealed many problems connected to enforcement, staffing levels, migration into the park and a management plan which set out a 25 year plan of action, but failed to provide more immediate goals via a programme to be implemented within a shorter time frame. The mission's follow-up report made a number of recommendations to tackle these problems and improve the site's management.¹¹⁷

These are just two instances amongst a number where the Bureau's or full Committee's recommendations and requests are influential in the monitoring and management of World Heritage Sites.¹¹⁸ However, the authority and influence of the Committee and its Bureau are also utilised at the nomination and inscription stage of listing.

¹¹⁶ 23rd Session of the Bureau to the World Heritage Committee, para. IV.34.

¹¹⁷ 24th Ordinary Session of the World Heritage Committee, para. III.1(iii).

¹¹⁸ Similar pressure was brought to bear upon India in relation to the Manas Wildlife Sanctuary. This World Heritage Site was placed on the World Heritage in Danger List in 1992, in part following the Indian Government's failure to respond to requests for reports on the state of conservation in the park over the preceding 3 years. In 1993, and following the continued failure of India to respond to requests for information, the Committee discussed the possibility of delisting the site. One month later at the start of 1994, India responded to the Committee's requests and ultimately a mission was sent to the park in 1997 when the security situation in the area had improved.

On approving the nomination of Yosemite National Park in 1984, the World Heritage Committee made special mention of a proposed dam construction in the vicinity and requested further information should these plans develop further.¹¹⁹ Six months later, the United States wrote to the Chairman of the Bureau to inform him that the relevant legislation had been changed and now precluded the possibility of dam construction in proximity to the world heritage site.¹²⁰ In another example involving the Lord Howe Island Group, the Bureau requested that, whilst they would be recommending the inscription of the property, the Australian authorities should extend the nominated area to include the lagoon and coral reef associated with the site – which they did.¹²¹ Similarly when the Great Barrier Reef was inscribed on the World Heritage List, the Committee noted that only a small proportion of the area nominated had been proclaimed as being included within the Great Barrier Reef Region and therefore protected under the Great Barrier Reef Marine Park Act of 1975. Consequently, the Committee requested that Australia ensure that the whole area to be inscribed be duly proclaimed and thereby protected.¹²² As Lyster notes:

undoubtedly stimulated by the new international status to be given to the Great Barrier Reef, the Prime Minister of Australia assured the 1981 meeting of the World Heritage Committee that the ‘Great Barrier Reef

¹¹⁹ 8th Ordinary Session of the World Heritage Committee, para IX.25(A).

¹²⁰ 9th Session of the Bureau to the World Heritage Committee, para. 36.

¹²¹ 6th Session of the Bureau to the World Heritage Committee, para II.7(A).

¹²² 5th Ordinary Session of the World Heritage Committee, para VIII.15.

Marine Park will be progressively extended. The question is not whether but when.¹²³

As these and the previous examples demonstrate, the World Heritage Committee appears to be well aware of their negotiating position when considering nominations and responding to the reactive monitoring conducted by IUCN for natural properties. It is suggested that this position, which allows a proactive approach to issuing recommendations to, and requesting information from, state parties, lies in part in the quality of IUCN's monitoring capacity, but principally in the notion of independent control over the World Heritage List and Danger List which was explored at the very start of this chapter. By holding the key to the financial and other benefits which listing brings, the World Heritage Committee has a degree of authority which it uses towards positive ends in holding contracting parties to their obligation to protect and conserve the natural heritage.

These benefits which flow from listing have in their own right positive consequences for the promotion of MPAs and the conservation of coral reefs. Much of this has come from the mobilisation of international assistance to support training programmes. For example, in 1989, training workshops in natural heritage conservation and protected area management for the Arabic, Anglophone African and Francophone African regions each received US\$30,000 in support from the World Heritage Fund.¹²⁴ In 1996, US\$48,000 was allocated to support the attendance of

¹²³ Lyster, *supra* n. 2 at 217. According to the Australian Bureau of Statistics, four new sections were added to the marine park between 1981 and 1984. Data available at www.abs.gov.au.

¹²⁴ 13th Session of the Bureau to the World Heritage Committee, para VI.14. The same amount was approved the following year for a training workshop on natural resource conservation and the management of protected areas in the Cameroon.

delegates at the 19th International Protected Area Conference which was held in Costa Rica.¹²⁵

The World Heritage Fund has also been used to support many of the 18 properties which contain coral reef ecosystems. The Costa Rican government received US\$40,000 in 2000 to support education and protection activities in the Area de Conservacion Guanacaste site, whilst Komodo National Park benefited from a US\$49,500 grant towards the purchase of equipment, training and conducting socio-economic studies in 1993. Finally, Aldabra Atoll in the Seychelles was successful in its request for US\$21,000 to purchase equipment for the warden's office in 1982.

The Committee has also made funds available for supporting the attendance of both cultural and natural heritage experts from least developed states at Committee meetings in order to encourage the election of these states to the panel of Committee members. US\$20,000 was set aside for this in 1989 and supported the participation of Tanzania and the Yemen. The World Heritage Fund is therefore proving its value in supporting the involvement of the least developed countries – in whose territory many coral reefs are located – and, more particularly, the fund is helping with training in protected area management and providing more focused support for properties which contain coral reefs.

Finally, it was noted in the first section to this chapter how the position of environmental ministries in intra-governmental policy deliberations can be strengthened through listing, particularly when a property is included in the World Heritage in Danger List. The significance of such forces was recognised in 2000

¹²⁵ 20th Ordinary Session of the World Heritage Committee, para XII A(2.1).

during consideration of the state of conservation for Sangay National Park. The Ecuadorian Minister for the Environment stated that:

the inclusion of Sangay National Park in the List of World Heritage in Danger had helped the Ministry of Environment in negotiations with the Ministry of Public Works and other Government bodies to obtain resources to evaluate environmental impacts of the Guamote Macas Road and plan mitigation measures.¹²⁶

The practical implications of the World Heritage Convention for the promotion of MPAs to conserve coral reef ecosystems seem particularly commendable. A sizable fund of money has been utilised to enhance training in nature conservation linked to protected area management. This can only serve to improve management standards in enclaves, including MPAs. Further, the fund has also directly benefited reserves containing coral reefs, usually through increasing enforcement and management capacity. However, perhaps the most significant implications of the convention lie in the strength of the monitoring and readiness to intervene as demonstrated by the World Heritage Committee. In an agreement designed to place so much control over access to prestige and benefits in one body, the Committee's opinions are generally given due respect. Together with the support provided by IUCN, this ensures that the standards of protection and conservation are kept at the forefront of state parties' plans for managing world heritage sites. Through the international assistance which has so far been provided, the World Heritage Convention is therefore well positioned to enhance the standards of management over coral reefs located within MPAs which are successfully nominated to the World Heritage List.

¹²⁶ 24th Ordinary Session of the World Heritage Committee, para. VIII.7. See also Lyster, *supra* n. 2 at 216 in relation to Darien National Park in Panama.

7. CONCLUSIONS

In the introduction to this chapter Birnie and Boyle's view that the World Heritage Convention was one of the centre-piece MEAs in international wildlife law was noted, and this study therefore set out to establish if this was still the case given a specific focus upon its role in promoting the conservation of coral reef ecosystems through MPAs. In the light of the matters discussed, whilst this study might recognise its potential importance, the ultimate role of the World Heritage Convention must surely be supporting rather than central.

Whilst protected areas as a strategy are implicit in the structure of the MEA, and often park boundaries coincide with pre-existing nationally and internationally protected areas, the convention's role in promoting MPAs lies predominantly in enhancing management standards as opposed to increasing the number of such parks. This is because the limited number of coral reefs which find themselves within the boundaries of World Heritage Sites stand to benefit both from the international aid available, and from one of the strongest reactive monitoring systems in international environmental law. This monitoring system is supported by the incentives and benefits offered to state parties through inscription of a property on the World Heritage List, the fact that access to such benefits is controlled by an independent panel of states, and the capacity and acceptance of monitoring undertaken by IUCN.

Despite these advantages and the use of protected area strategies to conserve coral reefs, many significant concerns have become apparent. First, the World Heritage Convention lags behind other MEAs in the sense that it is only recently that it has started to concern itself with matters beyond purely listing the world's heritage. Systematic reporting is a recent introduction, whilst guidelines on important aspects relevant for the everyday management of World Heritage Sites are lacking by

comparison to other MEAs. Significant in this regard is the lack of detailed guidance explaining the protection and conservation standards required in the management of sites, particularly in relation to the degree of human utilization of these protected sites. A clear understanding of this is required for the formulation of management plans and the operation of fair monitoring systems.

Secondly, the number of World Heritage Sites which include coral reef ecosystems is low. Whilst this may be a symptom of the recurring cultural-versus-natural heritage representation debate, the Hanoi Statement shows the regime's commitment and commendable action towards resolving this state of affairs. However, the hurdles which must be cleared during the listing process, together with the numerical limits set for nominations in any given year under the World Heritage Convention, make the current listing process cumbersome in the majority of cases. The comparative ease with which coral reef sites can receive international recognition and protection under the Ramsar Convention on Wetlands – as reflected in the numbers of such sites listed under that MEA – reinforces that regime's suitability for responding in a timely manner to the growing global call for both increasing the coverage of MPAs over coral reef ecosystems and, more particularly, improving the management of such enclaves.

Finally, and most significantly, the inherent exclusiveness of the World Heritage Convention – limited to protecting and conserving natural heritage which is of outstanding universal value – restricts the entire jurisdiction of the MEA to only a proportion of the Earth's coral reefs.

The authority and pro-active stance of the World Heritage Committee, together with the financial and other benefits which can enhance the management of coral reef sites, therefore demands that the convention be included in planning international efforts to

promote the conservation of coral reefs through MPA strategies. As Russell Train recognised in 1992, the World Heritage Convention:

has raised management standards and, most importantly, has provided technical training opportunities, particularly on a regional basis.¹²⁷

However, the significant inherent limits to its jurisdiction, and the cumbersome nature of the listing process, must surely lead to a strong supporting, rather than central, role for the World Heritage Convention in promoting the conservation of coral reefs through MPA strategies, behind that of MEAs with a far more inclusive substantive scope.

¹²⁷ Speech to the 16th Ordinary Session of the World Heritage Committee, December 1992, Santa Fe.

CHAPTER TEN – THE CONVENTION ON THE CONSERVATION OF MIGRATORY

SPECIES OF WILD ANIMALS

1. INTRODUCTION

During this study, multilateral environmental agreements (“MEAs”) which have sought to promote the conservation of coral reef ecosystems as an end in itself have been considered – albeit through marine protected area (“MPA”) strategies. There does, however, exist another global treaty where the conservation of coral reef habitat is promoted as a means towards a different end, namely to help migratory species. This regime is formulated under the 1979 Convention on the Conservation of Migratory Species of Wild Animals (“CMS”)¹ and the relevant agreements which have been concluded under its aegis.

It is important to briefly consider this regime in order to recognise its contribution to coral reef conservation, whilst also acknowledging the limitations of this indirect form of assistance to the global effort to address the problems facing these ecosystems. This study shall therefore consider the structure of the CMS, its potential application given the thesis’ particular focus and any steps which have been taken which promote MPA strategies for coral reef conservation. This will ultimately lead to a similar investigation into the international efforts under the CMS to conserve one particular family of migratory species – *Chelonioidea* or marine turtles.

¹ 19 *I.L.M.* 15. Unless otherwise stated, all references to ‘Articles’ in this chapter refer to provisions in the CMS.

2. THE CMS AND THE CONSERVATION OF HABITATS OF MIGRATORY SPECIES

During the course of their lifecycle, members of a migratory species will reside in or depend upon a variety of habitats. The migration between such habitats might be driven by a variety of reasons, such as breeding or feeding, and will often be triggered by the changing seasons. However, the division of the human world into defined areas such as national territories and legal zones has taken place independently of these natural patterns. According to De Klemm, three types of movements by species between such zones can be recognised:²

- (a) where migration between habitats takes place entirely within the limits of national jurisdiction;
- (b) where migration crosses the jurisdictional borders of two or more states; and
- (c) where migration occurs between areas of national jurisdiction and the High Seas.³

Migratory species will therefore find themselves, at various points in their lifecycle, subject to a number of different legal norms and resource utilization regimes. The potential problem this causes has long been recognised. As Recommendation 32 of the United Nations Conference on the Human Environment noted in 1972, divergence between such regimes poses the danger that a failure to protect migratory species in one jurisdiction will undermine another state's efforts to manage the migratory species as they move into or across its territory.

² C. De Klemm, "Migratory Species in International Law" (1989) 29 *Natural Resources Journal* 935 at 936-937.

³ De Klemm also suggested a fourth type of movement - where migration takes place entirely within the High Seas - but doubted whether this actually existed. *Ibid.*

As a classic transboundary problem, safeguarding such species therefore requires multilateral co-operative action between states whose territories are visited during migrations, or whose citizens engage in activities which impact upon the populations of these species as they journey between sites. The CMS was negotiated in order to provide such a regime, as well as a framework for further multilateral agreements.

2.1 THE PROVISIONS OF THE CMS

Historically, negotiations for the CMS were initiated by the Federal Republic of Germany in 1974 as a direct result of Recommendation 32 mentioned above and on account of the fact that no comprehensive multilateral regime existed for the conservation of migratory species.⁴ The convention was concluded on 23 June 1979 and entered into force in November 1983.

Article 1 defines migratory species as:

The entire population or any geographically separate part of the population of any species or lower taxon of wild animals, a significant proportion of whose members cyclically and predictably cross one or more national jurisdictional boundary.

As De Klemm points out, this definition can be taken to reflect the types of migrations described earlier in (b) and (c)⁵ but will exclude those performed entirely within the jurisdiction of one state or entirely within the High Seas.⁶

⁴ S. Lyster, *International Wildlife Law* (CUP) (1985) at 278-279.

⁵ *Supra* n. 2 at 937-938. As to difficulties surrounding the meaning of migratory, see Lyster, *ibid* at 281-282 and P. Birnie and A. Boyle, *International Law and the Environment* (OUP) (2002, 2nd Ed.) at 624.

⁶ C. De Klemm, "The Problem of Migratory Species in International Law" (1994) *Green Globe Yearbook* 67 at 70.

Fundamental to understanding the operation of the CMS is its classification of migratory species into two groups:

1. those which are endangered and listed in Appendix I to the convention – currently 118 species;⁷ and
2. those listed in Appendix II given that they have an unfavourable conservation status requiring international agreements for their conservation and management, or a conservation status which would significantly benefit from international co-operation through the conclusion of agreements – currently over 1,000 species.⁸

It should be noted that it is possible for a species from Appendix I to be listed in Appendix II as well if circumstances so warrant.⁹

There is a clear division between the treatment and regulation of species according to the Appendix in which they are included. For example, having identified species as falling within Appendix II, the CMS tends towards playing the role of a framework convention, encouraging the contracting parties to conclude further agreements for the conservation and management of individual Appendix II species or families of species.¹⁰ With the exception of a commitment to promoting, co-operating in and supporting research into migratory species generally,¹¹ no specific obligations for Appendix II species are found in the CMS itself. In contrast, the CMS does contain

⁷ Article III.

⁸ Article IV. As Lyster notes (*supra* n. 4 at 280), this structure differs from that of CITES which, whilst also adopting a two tier system of Appendices, divides species according, *inter alia*, to their level of endangerment.

⁹ Article IV(2).

¹⁰ Article II(3)(c). These efforts are discussed in more detail later in this chapter.

¹¹ Article II(3)(a).

and impose obligations upon contracting parties relating to Appendix I species, as will be discussed below. Some Appendix I species may therefore, in theory and sometimes in practice, find themselves subject to conservation obligations under both CMS and a further multilateral agreement established under the convention's auspices.

This study, therefore, will now consider the obligations which are set out in the CMS and which relate to Appendix I species, in order to demonstrate how the convention views habitat conservation as a means towards protecting these endangered migratory species.

2.2 OBLIGATIONS RELATING TO APPENDIX I MIGRATORY SPECIES

Appendix I lists those migratory species which are endangered – meaning those species which, on the basis of reliable evidence, including the best scientific evidence available,¹² are in danger of extinction throughout all or a significant portion of their range.¹³

The most significant threats to migratory species are unsustainable exploitation, habitat destruction and disturbance by man. The obligations under the CMS therefore focus upon these problems when dealing with Appendix I species. These obligations are imposed upon 'range states' – a term which it is worth exploring further. Such range states are defined as any state exercising jurisdiction over any part of the range of a migratory species, or whose vessels are engaged outside of jurisdictional limits in taking such species.¹⁴ The range of the migratory species, in turn, includes:

¹² Article III(2).

¹³ Article I(1)(e).

¹⁴ Article I(1)(h).

all areas of land or water that a migratory species inhabits, stays in temporarily, crosses or overflies at any time on its normal migration route.¹⁵

As was intended, and given the above reference to water (which is not limited to fresh water) the obligations relating to Appendix I species will, where applicable, have a bearing upon the marine environment of range states. Indeed, the same can be said of the efforts to conclude further agreements relating to Appendix II species since such agreements also focus upon range states and use the same definition.

Turning to the obligations themselves, those relating to exploitation of Appendix I species impose strict controls. According to Article III(5), range states “shall prohibit” the taking of Appendix I species, subject to limited exceptions including scientific reasons, and respecting the needs of traditional subsistence users or other extraordinary circumstances. Even in such exceptional circumstances, Article III stipulates that such taking must not disadvantage the species in question and that range states must inform the secretariat when they wish to use the exception.

Of more particular interest to this study, however, are those obligations imposed upon range states which involve steps to conserve the habitat of Appendix I migratory species. However, in contrast to the obligations which specify that range states ‘shall prohibit’ exploitation, these obligations only require range states to ‘endeavour’ to meet them.¹⁶ The extent of the latter obligations might therefore be regarded as less rigorous than those of the former given the qualification of the obligations. Nevertheless, such ‘endeavours’, according to Article III(4), cover removing,

¹⁵ Article I(1)(f).

¹⁶ Article III(4).

preventing or compensating for the effects of activities and obstacles which impede or stop migrations. Further, and of particular interest to this study, Article III(4)(a) requires range states to endeavour:

To conserve and, where feasible and appropriate, restore those habitats of the species which are of importance in removing the species from danger of extinction.

Potentially, therefore, this obligation could encourage the conservation of coral reef habitat, despite there being no direct reference to coral reefs nor MPA strategies.

The relevance of Article III(4)(a) to coral reef ecosystems will depend upon the inclusion within Appendix I of migratory species whose life cycles include periods of time spent around these habitats, and this will be discussed later. However, this study will first consider the lack of direct endorsement in the convention's text of protected area strategies for achieving habitat conservation and restoration. This is, of course, in contrast to the MEAs previously considered which have made specific mention of such strategies in the text of the convention,¹⁷ or which have adopted enclaves as an integral part of their operation.¹⁸ This omission on the part of the CMS fails to maximise the opportunity which was available to advance such strategies through explicit and prescriptive legal provisions.

That said, the CMS does endorse protected area strategies, and therefore MPAs, as part of meeting the obligations imposed upon contracting parties. To find such endorsement, though, it is necessary to look beyond the convention's text, and to search through the records of the Conferences of the Contracting Parties ("COPs"),

¹⁷ See Chapter 7 on the CBD.

¹⁸ See Chapters 8 and 9 on Ramsar and the World Heritage Convention.

and the various standing committees which support the work of the COPs and the convention.

In general it is clear from proceedings that some states and regional organizations have used enclave strategies in a manner which benefits the conservation of habitats and migratory species.¹⁹ However, initiatives led by the CMS have taken time to materialise, despite the observer for the International Council for Bird Protection presenting his view at the first COP that a network of protected areas along migration routes was essential for conserving migratory species.²⁰ The significance of protected areas is, however, now being given welcome recognition in CMS work plans. In 1997, the CMS's *Strategy for the Future Development of the Convention for 1998-2000*²¹ set as a high priority:

In the case of critically endangered species listed in Appendix I, Parties should designate protected areas... so that a network of critical sites is established throughout the migration route of species concerned.²²

Subsequent work programmes have continued to highlight enclave strategies as part of meeting the convention's objective. The strategic plan for 2000-2005 sought to ensure that government policies at the national and regional levels consider the

¹⁹ See for example, comments made by the EEC *Proceedings of the First Meeting of the Conference of the Parties Vol. 1*, at 21, para 22.

²⁰ *Ibid* at 23, para 33.

²¹ Adopted at COP 5 under Resolution 5.4.

²² Objective 5.2.

designation and development of reserves,²³ whilst the plan for 2006-2011, entitled “On the Move to 2010”, requires under objective 2.7 that:

The most important key habitats/sites for migratory species in each range state are protected and connected, where appropriate, through networks of protected areas and corridors.²⁴

This objective goes on to require that related guidelines be drawn up by the scientific council to the convention for presentation at the next COP in 2008 and for the parties to report in 2011 on up to 10 of the most important migratory species sites in their jurisdiction and on their inclusion in the proposed networks.²⁵

Commendably, although belatedly, the CMS is now promoting enclaves as a strategy for conserving habitats as a means to help migratory species. Given that the CMS operates in the marine environment, these moves can be taken to extend to MPAs. However, the late start of these initiatives, the absence of any inventory mechanism for protected areas and the lack of data on the matter,²⁶ means that assessing the impact of the CMS for promoting MPAs will have to wait, perhaps until contracting parties begin to report on such matters.

Leaving this to one side, in recognising the potential of Article III(4)(a) to promote the conservation of coral reef ecosystems as the habitat of Appendix I species, one other initiative relating to this article deserves to be highlighted. This centres on the

²³ Objective 2.2.

²⁴ “On the Move to 2010 : Convention on the Conservation of Migratory Species of Wild Animals, Strategic Plan 2006-2011” as adopted under Resolution 8.2.

²⁵ *Ibid.*

²⁶ The form of reports submitted by parties prior to each COP was only changed to demand information on protected areas in time for COP8 in 2005. Further, report submission is notoriously poor with respect to CMS.

Scientific Council to the CMS and the COP agreeing to “Concerted Actions” for particular Appendix I species, and finds its origin at the 3rd COP held in Geneva in 1991.²⁷ The special attention these species receive under the initiative takes the form of reports on conservation status prepared by the Scientific Council, monitoring of the implementation of Article III(4) for these species by the contracting parties and the development of specific projects which can receive funding from the CMS Trust Fund. Such projects might include small scale catalytic research or conservation initiatives, or supporting more wide ranging management regime development in the form of Action Plans and/or Memoranda of Understanding.²⁸

As has been claimed by the Scientific Council, the “Concerted Action” initiative is evidence that the CMS is truly operational,²⁹ and is one of the key means for promoting and monitoring the implementation of Article III(4).³⁰ 42 species from Appendix I have so far been nominated and accepted for such focused action under the scheme.

The above ultimately highlights the importance of the inclusion in Appendix I of migratory species who spend periods of time in and around coral reefs, in the context of transforming into reality the potential benefits of the CMS for conservation of these ecosystems through MPA strategies.

²⁷ Resolution 3.2.

²⁸ For example, by 1998, highly focused Action Plans had been developed and adopted for the Siberian Crane and Sahelo-Saharan Ungulates.

²⁹ Report of the 8th Meeting of the CMS Scientific Council, para 7.

³⁰ *Identification and Implementation of Concerted Actions for Selected Appendix I Species/Groups* 15 September 2002 (ScC11/Doc.3/Rev.1).

2.3 CORAL REEFS AND APPENDIX I MIGRATORY SPECIES

The general understanding of the role that coral reef ecosystems play in the survival of migratory species is far from complete. Indeed, in its publication *Conventions and Coral Reefs*, UNEP stated that there was a need for work to be conducted in the future for listing all those migratory species that occur in coral reef areas, such as fish and sharks.³¹ In consequence, it is unfortunately not possible at this stage to assess whether or not migratory species are common visitors to coral reefs, nor whether the Appendices to CMS are comprehensive from this thesis' particular point of view. It is possible, however, to make some more general observations, and to review the current make-up of the CMS Appendices to see if species are listed therein which are found in coral reef areas.

In general some species are known to spend part of their life cycles in or around coral reefs. The most obvious examples are found in the family *Cheloniidae*, namely marine turtles. Seven species occur within tropical waters, and nest on coastlines close to reefs. More importantly, three are known to make regular use of coral reef ecosystems as a source of food. The Hawksbill Turtle (*Eretmochelys imbricate*) and the Loggerhead Turtle (*Caretta caretta*) both feed on invertebrates. Further, the Green Turtle (*Chelonia mydas*) feeds on marine plants and algae which occur as part of the coral reef ecosystem.³²

Of course, marine turtles are not the sole family of migratory species which visit coral reefs. Dolphins are often sighted in tropical waters and may occasionally feed on reef fish.³³ Further, seabirds are another important migrant visitor to tropical islands and

³¹ UNEP/WWF, *Conventions and Coral Reefs* (2003) at 14. Available at www.unep.org.

³² M. D. Spalding *et al*, *World Atlas of Coral Reefs*, (University of California) (2001), at 43.

³³ *Ibid* at 44.

therefore may be found to nest near to coral reefs.³⁴ It is, however, harder to make direct links between these seabirds and their dependence upon the coral reef ecosystems as a food resource since they may be primarily offshore pelagic feeders.³⁵ Finally, whale sharks are sometimes sighted around tropical coral reefs where they feed upon plankton in the water.³⁶ The ability to make a link between coral reef ecosystems and whale shark feeding requirements may therefore be more obvious than in relation to seabirds.

This again emphasises the potential relevance of a convention on migratory species to coral reefs. However, a review of the Appendices to CMS reveals the limited application in reality of the CMS for promoting conservation of these habitats. Of the species listed in Appendix I, only three which can confidently be identified as depending upon coral reef ecosystems are listed, these being the Hawksbill, Loggerhead and Green Turtle. Whilst birds and mammals³⁷ are well represented in Appendix I, only four fish species are listed.³⁸

The inclusion of the three species of marine turtle means that the habitat conservation obligations discussed in Part I, together with the endorsement of MPA strategies, apply to some areas of coral reef. Whilst this supports this study's recognition of the relevance of the CMS to the research question, there still exist further limitations to

³⁴ For example, Heron Island in the Great Barrier Reef Marine Park is visited by approximately 70,000-120,000 Black Noddys for the breeding season between October and February; V. Ross, "Queensland: Natural Selection" *The Advertiser* (Adelaide) at 24.

³⁵ Spalding, *supra* n. 32 at 43.

³⁶ *Ibid* at 99 for an example in relation to their presence in the Flower Garden Banks US National Marine Sanctuary on the Gulf of Mexico.

³⁷ Although excluding marine dolphins.

³⁸ The White Shark, the Basking Shark, the Atlantic Sturgeon and the Giant Catfish.

the convention and the way it can promote MPA strategies for coral reef conservation. The habitat conservation obligations are limited in their application to:

- 1) coral reef states which are range states for these three species and which are also parties to CMS; and
- 2) those areas of coral reef, within the states noted above in (1), which are known to be visited by these species of marine turtle.

In the light of this, some further observations are needed.

Turning initially to identifying the states which currently fall within (1) the first question becomes, how many coral reef states are range states for the relevant turtle species? The task of assessing this is helped by CMS maintaining records of the range states for all listed species. From this, it can be noted that for the Green and Hawksbill Turtles, all of the coral reef states which are identified in Appendix I to this Study are recorded as range states.³⁹ However, a number of Pacific coral reef states are not recorded as range states for the Loggerhead Turtle, namely Kiribati, the Marshall Islands, Nauru, and Palau.

Whilst it is possible to classify the vast majority of coral reef states as range states for turtles, the fact remains that not many are actually party to the convention. As indicated in Appendix I to this study, only 23 of the world's 83 coral reef states are contracting parties to CMS, representing 45.2% of the earth's coral reefs. Fortunately, all of these countries are range states for Green, Hawksbill and Loggerhead Turtles. Ultimately, however, the overall poor levels of participation by coral reef states

³⁹ The omission of Jordan as a range state is believed, by the author, to be an oversight given the presence of neighbouring states in the Gulf of Aqaba (such as Egypt, Israel and Saudi Arabia), and Jordan's participation in the IOSEA memorandum of understanding on the conservation of marine turtles (discussed later in this chapter).

means that the habitat conservation obligations for Appendix I species apply to a smaller number of the range states for these species of marine turtle.

Of course, the application of the habitat conservation obligation is not limited solely by reference to the incidence of participation in the CMS by coral reef range states. A second limitation to the application of the obligation has already been noted, namely that it will only apply to those areas of coral reef known to be visited by these Appendix I species. Therefore, an unknown proportion of the 45.2% of global coral reefs will actually be visited by Green, Hawksbill, and Loggerhead Turtles, and consequently require conservation and rehabilitation for their benefit. This study's use of turtles as a case study has therefore served to highlight the actual limitations of the CMS for promoting the conservation of coral reef ecosystems through MPA strategies. Significantly, this limitation reaches beyond the basic need for migratory species which visit coral reefs to be included in Appendix I.

Despite such uncertainties, it is worth commending the pro-active nature of the CMS' stance in relation to conserving species of marine turtles. Whilst dedicated measures under regional agreements will be looked at in the second half of this chapter, the parties to the CMS are themselves seeking to implement Article III(4) for the conservation of marine turtles through the "Concerted Actions" initiative which was highlighted earlier. Marine Turtles have fallen under this arrangement since its inception in 1991, and implementation of the convention's obligations in relation to these species has been duly monitored by the regime. In May 2001, for example, a presentation on the conservation status of marine turtles highlighted the need to

reduce mortality through by-catch, as well as halting and reversing habitat loss by restoring reefs and sea grass pastures.⁴⁰

2.4 SUMMARY

So far this study has noted that the CMS aims, *inter alia*, to protect migratory species of endangered wild animals through conserving areas of habitat upon which they depend. The obligation in question is imposed upon the range states of species listed in Appendix I, and, through the various definitions employed within the convention, applies to marine habitats. Further, by looking beyond the actual terms of the treaty, it has been noted how, albeit belatedly, the CMS recognises that enclave strategies are important in meeting this obligation. The potential for the CMS to promote the conservation of coral reef ecosystems was therefore identified, leaving this study to assess how this translated into real terms. Central to this were two issues – establishing that there were species listed in Appendix I which relied upon coral reef habitat, and on the basis that such species did exist, just how much coral reef fell under the ambit of the habitat conservation obligation.

Having recognised that information was scarce on the relationship between migratory species and coral reefs, it was nevertheless noted that a number of marine turtles which were known to rely upon these habitats were listed in Appendix I, and were also benefiting from inclusion in the CMS “Concerted Actions” initiative. Unfortunately, judging the amount of coral reef which was thereby brought under the conservation obligations was difficult, although the restricted number of the world’s coral reef states which have become contracting parties to the CMS has a significant limiting impact upon the geographic application of the convention.

⁴⁰ Report of the 10th Meeting of the CMS Scientific Council, para 69.

3. CMS AND APPENDIX II

The CMS was also negotiated and drafted to act as a framework for the negotiation and conclusion of additional agreements in relation to those species listed in Appendix II. Before discussing these agreements, two points are best made at this stage given the foregoing discussion. The first is that Article V(2) provides that these extra agreements should be open to accession by all range states, whether or not they are parties to the CMS. Consequently, the limitations of CMS membership by coral reef states, need not stand in the way of any additional agreement which deals with a species known to visit coral reef areas from seeking more comprehensive engagement by range states.

Secondly, however, Appendix II offers little by way of inclusion of a larger number of species which visit coral reefs. Whilst the marine turtle species are again listed, including the Green, Hawksbill and Loggerhead, the inclusion of many dolphin species and the Whale Shark are perhaps the only other species which can be regarded, with any certainty, as depending upon the resources found within coral reef ecosystems. As will be seen below, however, given the absence of further agreements for Dolphins and Whale Sharks in tropical regions,⁴¹ this once again leaves this thesis focusing upon action taken to help species of marine turtles.

3.1 FURTHER AGREEMENTS AND THE PROTECTION OF MARINE TURTLES

CMS envisages and encourages the conclusion of further multilateral agreements for migratory species. These divide into two principal types. In the first instance, Article IV(3) requires range states of Appendix II species to endeavour to conclude

⁴¹ Certain dolphin species are covered by agreements for the Baltic, North and Black Seas as well as the Mediterranean. And see further, *infra* n.48.

agreements where these would benefit the species, giving priority to those with an unfavourable conservation status.⁴² In addition, Article IV(4) seeks to encourage the conclusion of further agreements for any species which ‘periodically’ crosses one or more national jurisdictional boundary. In order to distinguish the two, the text of the CMS adopts the use of upper case for the former (i.e. ‘AGREEMENTS’) and lower case for the latter. To date, three AGREEMENTS have been concluded compared to 10 Agreements. These are identified in Table 3.

The two types of arrangement are quite distinct in terms of their treatment in the convention’s text and operation. AGREEMENTS are to be concluded in relation to Appendix II species, whilst Agreements need relate to neither such listed species, nor, in fact, to species which strictly meet the definition of ‘migratory’ under CMS. In addition, CMS provides certain criteria or guidelines which either must, or should, be reflected in the provisions of AGREEMENTS, while remaining silent in relation to Agreements. Set out in Article V, the guidelines for AGREEMENTS include a statement that the object of each shall be “*to restore the migratory species concerned to a favourable conservation status or to maintain it in such a status*”,⁴³ followed by recommendations for what should be incorporated. Each AGREEMENT should therefore, *inter alia*:

⁴² Whilst such agreements are the primary means for conserving Appendix II species, the CMS has since 1997 operated a “Co-operative Actions” initiative for such species which are deemed not immediately suitable for agreements or MoU’s, but which nevertheless would benefit from some form of action in the interim. This scheme is very similar to the “Concerted Action” initiative for Appendix I species. To date, 41 species fall under this scheme - see Recommendations 5.2, 6.2 and 8.28.

⁴³ Article V(1).

Table 3 – Agreements and Memoranda of Understanding Concluded Under CMS Auspices.

Title	Date	AGREEMENT	Agreement
Agreement for the Conservation of Seals in the Wadden Sea Area	16.10.1990		X
Agreement on Conservation of Populations of European Bats	04.12.1991	X	
Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas	17.12.1992		X
Agreement on the Conservation of African-Eurasian Migratory Waterbirds	16.06.1995	X	
Agreement on the Conservation of the Cetaceans of the Black Sea, Mediterranean and Contiguous Atlantic Area	24.11.1996		X
Agreement on the Conservation of Albatrosses and Petrels	19.06.2001	X	
Memorandum of Understanding Concerning Conservation Measures for the Slender-Billed Curlew	10.09.1994		X
Memorandum of Understanding Concerning Conservation Measures for the Siberian Crane	13.12.1998		X
Memorandum of Understanding Concerning Conservation Measures for Marine Turtles of the Atlantic Coast of Africa	29.05.1999		X
Memorandum of Understanding on the Conservation and Management of the Middle-European Population of the Great Bustard	05.10.2000		X
Memorandum of Understanding on the Conservation and Management of Marine Turtles and their Habitats of the Indian Ocean and South-East Asia	23.06.2001		X
Memorandum of Understanding Concerning Conservation and Restoration of the Bukhara Deer.	16.05.2002		X
Memorandum of Understanding Concerning Conservation Measures for the Aquatic Warbler	13.04.2003		X

1. cover the whole range of the migratory species;⁴⁴
2. where appropriate and feasible, conserve and where required restore habitats of importance in maintaining a favourable conservation status and protection of such habitats from disturbance;⁴⁵
3. where appropriate and feasible, maintain a network of suitable habitats in relation to migratory routes;⁴⁶ and
4. where appropriate, feasible and desirable, provide new habitats favourable to migratory species.⁴⁷

Although a few species believed to spend part of their life cycle around coral reef ecosystems are included in Appendix II, and whilst the previously mentioned guidelines and criteria emphasise the importance of habitat protection for helping such species (albeit without direct reference to MPA strategies), no AGREEMENT for tropical maritime areas has yet been concluded in relation to these Appendix II species.⁴⁸ This is in contrast to the two marine turtle Agreements which have been concluded under Article IV(4) which are identified in Table 3. In the absence of a relevant AGREEMENT, it is to these two initiatives which this study shall turn.

⁴⁴ Article V(2).

⁴⁵ Article V(5)(e).

⁴⁶ Article V(5)(f).

⁴⁷ Article V(5)(g).

⁴⁸ That said, the Whale Shark is included under the “Co-operative Actions” scheme (*supra* n. 42). Further, the Philippines has been designated as the focal point for developing an MoU for this species, although the most recent available records indicate that there has been virtually no progress towards such an agreement – Report of the 12th Meeting of the CMS Scientific Council, Annex 5.

3.2 AGREEMENTS FOR THE CONSERVATION OF MARINE TURTLES AND THEIR HABITATS

The two Agreements relating to marine turtles which have been agreed cover two separate regions, namely the Atlantic Coast of Africa, and the Indian Ocean and South-East Asia. Both are expressed to be Memoranda of Understanding (“MoUs”) and contain non-binding commitments on the parts of signatory states. However, because it is believed that no true coral reefs occur along the Atlantic coast of Africa due to freshwater input from the Niger into the Gulf of Guinea and the sea temperature being too low to suit reef formation, the latter MoU for the Indian Ocean and South-East Asia is the most relevant to this study.⁴⁹ This study will therefore focus upon that MoU; commonly referred to by the short-hand name IOSEA.⁵⁰

3.2.1 *Provisions of the IOSEA MoU*

Negotiations of IOSEA were concluded on the 14th July 2000 and the agreement entered into force on the first day of the third month following its signature by a second state⁵¹ – namely the 1st September 2001. The agreement reached is divided into sections covering definitions, objectives, actions, and basic principles, and incorporates a management plan which was annexed to the memorandum after its finalisation in July 2001.

⁴⁹ Spalding *et al.*, *supra* n. 32 at 174-175. It should be noted that, in the light of listing details provided to the Ramsar Convention on Wetlands, Equatorial Guinea and Guinea both claim to have small areas of coral reef. See Chapter 8. This has been reflected in Appendix I to this study although the total area of reef in global terms is likely to be insignificant. It is therefore difficult to understand how the Preamble to the Atlantic Coast of Africa MoU can make reference to turtles being dependent for their survival upon the conservation of widespread marine habitats including coral reefs. It might be technically accurate to say that coral reefs have a small presence in the region but they are far from widespread in the area.

⁵⁰ Text available at www.oceanlaw.net/texts/index2.htm.

⁵¹ IOSEA Basic Principle 1.

The overall objective is:

to protect, conserve, replenish and recover marine turtles and their habitats based on the best scientific evidence, taking into account the environmental, socio-economic and cultural characteristics of the signatory States.⁵²

In turn, marine turtles are defined by reference to six species including the Loggerhead, Green and Hawksbill Turtle – species which this study has already recognised as being dependent upon coral reef ecosystems.⁵³ Flowing from this, it is important to note that habitat, for the purposes of the memorandum, means all those aquatic and terrestrial environments which these marine turtles use at any stage of their life cycle.⁵⁴ This therefore incorporates coral reefs within the region; a fact made more explicit in other parts and contexts.

In pursuit of the overall objective, signatory states have indicated that they will undertake a number of actions. Some of these actions concern administrative and procedural matters, such as co-operating in the establishment of a Secretariat and Advisory Committee on scientific, technical and legal matters, as well as reporting regularly to the Secretariat on the implementation of the MoU.⁵⁵ The document also provides for annual Meetings of the Signatory States of which three have taken place to date.⁵⁶ Further, states will co-operate in achieving and maintaining a favourable

⁵² IOSEA Objective.

⁵³ IOSEA Definitions 1.

⁵⁴ IOSEA Definitions 2.

⁵⁵ IOSEA Actions 5, 6 and 8 respectively.

⁵⁶ IOSEA Basic Principles 3.

conservation status for marine turtles and the habitats on which they depend.⁵⁷ To this end a detailed Conservation and Management Plan, broken down into six objectives, has been formulated and appended to the MoU with the signatory states agreeing to implement its provisions.⁵⁸

The plan is particularly significant for the focus of this study, on account of the constituent parts of its second objective. Objective 2 to the Conservation and Management Plan concerns the need to “Protect, conserve and rehabilitate marine turtle habitats”. This objective is to be pursued through two programme elements. The first seeks to establish “*necessary measures to protect and conserve marine turtle habitats.*”⁵⁹ The plan then specifies these measures more particularly, namely to:

- a) identify areas of critical habitat such as migratory corridors... and feeding areas;
- b) designate and manage protected/conservation areas, sanctuaries or temporary exclusion zones in areas of critical habitat...;
- c) develop incentives for adequate protection of areas of critical habitat outside protected area;
- d) undertake assessments of the environmental impact of marine and coastal development and other human activities that may affect marine turtle populations and their habitats;...⁶⁰

⁵⁷ IOSEA Actions 1.

⁵⁸ IOSEA Actions 2.

⁵⁹ IOSEA Conservation and Management Plan Objective 2.1.

⁶⁰ *Ibid.*

These actions have been highlighted in order to emphasis how the plan not only promotes MPAs as a conservation strategy for marine turtle habitat, including coral reef ecosystems, but also recognises factors beyond the mere designation of an area which have a bearing on the fulfilment of management objectives within it, such as management of the wider environment outside park boundaries.

The second programme element confirms this study's assertion about the particular need to conserve coral reefs as marine turtle habitat. Concerned with rehabilitating degraded marine turtle habitat, Objective 2.2 requires states to undertake activities aimed at enhancing the "recovery of degraded coral reefs".

3.2.2 Progress under the IOSEA MoU for the Conservation of Coral Reefs

Given the potential for IOSEA to promote the conservation of coral reef habitat through MPA strategies as a means of conserving and protecting marine turtles within the region, the need arises to review of any progress made to date which is of relevance to this study. This task is aided by the records which have been maintained of the annual Meetings of the Signatory States, as well as the reports which have so far been filed by the various states involved.

As per earlier chapters, however, the geographic coverage of IOSEA will be assessed first. There are currently 23 states who have signed the MoU out of a possible 41 range states within the region, plus the USA. All of the signatory states, except Pakistan, are host to coral reef ecosystems, whilst 11 of the signatory states are also contracting parties to CMS. This membership is illustrated in Appendix I to this study. From this it is clear that some range states of marine turtles which are also significant coral reef host nations in the region have yet to become signatories, e.g. the Maldives, Malaysia and Papua New Guinea. However, the data from Appendix I

to this study seems to suggest that the geographic coverage of the MoU currently incorporates 54.16% of the earth's coral reefs - almost 10% more than the coverage of the CMS.⁶¹ The total possible coverage given the 41 range states accounts for approximately 76.27%. Again, however, there are some important limitations on these figures. First, not all of the reefs which fall within the jurisdiction of the UK (1.94%) and France (5.02%) lie within the IOSEA region. Further, the actual percentage of coral reefs which can potentially benefit from conservation measures is, as before with respect to the CMS and endangered migratory species, limited to those areas of reef being used by marine turtles as habitat.

It is therefore difficult to know exactly what percentage of the coral reefs in the region should, or could possibly, be conserved as a means towards helping protect marine turtles. What is significant, however, is the involvement of particular states. In the course of earlier discussions in Chapter 6 concerning the United Nations Regional Seas Programmes, it was highlighted that regional initiatives may not be effective in providing developing nations with funding and capacity building support where an insufficient number of developed nations are also involved. Such non-engagement might be because the geographical scope of the initiative does not incorporate sufficient developed states, or the drafting does not allow for non-regional state participation.

IOSEA benefits from having both regional developed signatory states – Australia, France and the UK – and being drafted so as to allow for participation by non-range

⁶¹ As has already been pointed out, this is possible since membership of AGREEMENTS and Agreements under CMS is not limited to contracting parties to the Convention. As an example of this, the support of Indonesia – with almost 18% of the world's coral reefs – has led to IOSEA having a greater geographic coverage.

states. This has enabled the US to be involved. Indeed, the preamble to the MoU notes:

the desirability of involving other States whose nationals or vessels conduct activities that may affect marine turtles of the Region, as well as States that may be in a position to contribute resources or expertise that may promote the implementation of this Memorandum of Understanding;

IOSEA has therefore been able to benefit from modest but regular financial support, enabling it to operate a secretariat in UNEP's regional office in Bangkok, and conduct awareness-raising initiatives such as the 2006 Year of the Turtle.

In the light of such support and capacity, it is not surprising to find that the three Meetings of the Signatory States have been productive. The records of these meetings, whilst not as extensive as under the MEAs so far reviewed in this study,⁶² also give a good indication of progress to date under the Conservation and Management Plan, whilst coral reef conservation efforts are also regularly highlighted by signatory states as evidence that they are complying with IOSEA's call for action. Of course, the extent to which these initiatives have arisen as a result of IOSEA is difficult to determine, and it seems likely that such initiatives may equally be being pursued to meet a variety of habitat conservation obligations under other MEAs, Regional initiatives, or national policies. For example, at the 3rd Meeting of Signatory States,⁶³ the Seychelles reported that, together with Comoros, Madagascar, Mauritius and France, it was involved in the establishment of a coral

⁶² Due to the relatively recent development of this MoU and the small number of meetings which have so far taken place

⁶³ Under Agenda Item 7 (Presentation and Discussion of *Complementary* Initiatives) - emphasis added.

reef network under the auspices of the regional Commission de l'Océan Indien.⁶⁴

Under the same agenda item, Australia gave an account of its Regional Natural Heritage Programme, which included AU\$10 million for conserving biodiversity hotspots such as coral reefs in the Bismarck Sea, Papua New Guinea and MPAs in Sulawesi, Indonesia.⁶⁵

Whilst signatory states are therefore apparently aware of the need to conserve coral reef ecosystems through MPAs as part of the MoU's objectives for protecting marine turtles, and whilst a number of initiatives seem to be underway, it is difficult to link the initiation of such initiatives to IOSEA itself. As suggested, the reality may well be that such initiatives are pursued in order to meet a range of national, regional and international commitments.

With respect to implementing the MoU and in particular the Conservation and Management Plan, a summary has been prepared for the last two Meetings of the Signatory States based upon the reports submitted by states.⁶⁶ Overall, the most recent report found that most of the signatory states were monitoring their coral reefs and/or making an effort to help degraded coral reefs recover. With specific reference to Objective 2.2 of the Conservation and Management Plan (which concerned rehabilitating degraded habitat and which drew particular attention to coral reefs), the report also records that Australia, the UK and the Seychelles have made good progress in this regard, whilst Kenya, Madagascar, Oman, Philippines, Thailand and

⁶⁴ 3rd MoSS, para 19.

⁶⁵ *Ibid*, para 20.

⁶⁶ The most recent report available is the *Review of Implementation Progress*, 1 March 2005 (MT-IOSEA/ss.3/doc 7.2). Copies available at www.ioseaturtles.org.

Vietnam are recognised as having made some progress, albeit limited in scope.⁶⁷ The remaining countries had either provided insufficient or no information to assess implementation, or had reported no progress.

The position with respect to Objective 2.1 on habitat conservation, which as was noted placed particular weight upon MPA strategies, is recorded as being stronger. Here, Australia and the UK are recorded as having made very substantial progress, whilst Comoros, Oman, Philippines, Sri Lanka, Thailand, Tanzania and Viet Nam were all recognised as having made good progress through partial implementation. The remaining states, except for Cambodia, Iran and Jordan,⁶⁸ had made some progress.

These records give a general idea as to progress under the Conservation and Management Plan, which, when taken together with the observations about coral reefs, are encouraging. However, other developments under IOSEA are also interesting from the perspective of conserving coral reef ecosystems through MPA strategies.

IOSEA is currently exploring the possibility of establishing a network of sites which are of critical importance to marine turtles. These sites would be accorded recognition under the MoU following a nomination procedure similar to that employed by the World Heritage Convention. As such, the current proposal from 2005 therefore seeks to build upon the benefits of such recognition, which IOSEA

⁶⁷ *Ibid*, Annex 4.

⁶⁸ These states had either provided insufficient or no information, or reported no progress under this objective.

believes includes raising the profile of the sites and stimulating international co-operation.⁶⁹

Whilst only in an embryonic form, the move is at least commendable in recognising that mechanisms to accord international recognition are amongst the more beneficial initiatives which can be deployed under international arrangements, often to the benefit of MPAs. That said, much remains to be resolved and it is questioned whether the IOSEA need establish its own mechanism. For example, it needs to be decided how the scheme will fit into the current landscape of internationally important sites, since there appears to be conflicting opinion at present as to whether IOSEA sites should be recognised under other MEAs like Ramsar and the World Heritage Convention.⁷⁰ Also, determining the criteria for selection of such sites remains unresolved, whilst it will also be important to ensure that the modest resources made available to IOSEA, and noted earlier, are not swallowed up in administering a selection procedure, rather than supporting more direct conservation activity.

It is easy to understand the desire to establish such a network. These reasons, which include influencing decision makers, exposing site management to international scrutiny and mobilising international assistance, have been discussed in some detail through-out this study. It is, however, questioned whether this initiative is beyond the resources of IOSEA, and whether similar ends could be achieved through encouraging signatory states to the MoU to use existing mechanisms. For example, the Ramsar Convention on Wetlands does allow wetlands to be listed as internationally important on account of the fact that they support vulnerable or endangered species. Given that all bar Oman and Saudi Arabia are parties to Ramsar,

⁶⁹ 3rd MoSS, Agenda Item 9(a), para 39-44.

⁷⁰ *Ibid*, para 40.

listing is a unilateral act, and the boundaries of listed wetlands are allowed to incorporate coastal areas (which could therefore include nesting sites), such an approach is both possible and perhaps a more efficient use of resources.

IOSEA plainly demonstrates the potential for Agreements concluded under CMS to promote the conservation of coral reef ecosystems through MPA strategies, albeit as a means towards the separate goal of protecting migratory species – in this case marine turtles. The MoU recognises the importance of conserving coral reef habitat through enclave strategies, and as an initiative is commendable on a number of levels. There is an impressive level of activity under the MoU and initiatives such as the development of a clear Management and Conservation Plan, active monitoring of implementation, and the consideration of a Network of Turtle Sites, reflect both a genuine commitment on the part of the States involved to elaborate conservation objectives and an awareness of the range of tools available to them.

3.3 BEYOND IOSEA – ADDITIONAL REGIONAL TURTLE INITIATIVES

For the sake of completeness, it is worth making some observations about other regional initiatives which conserve the habitat of marine turtles (and therefore potentially coral reef ecosystems) as part of protecting these species. For example, the MoU covering the Atlantic Coast of Africa has already been mentioned. However, its significance for coral reefs is doubted since, despite being concluded before IOSEA, progress under this MoU has been less marked. The report of the working group on marine turtles to the Scientific Council recorded, in 2004, that there had been “*limited significant progress in implementing the MoU*” since its adoption, with Nigeria suggesting a need for “*revitalising activities*” under the

arrangement.⁷¹ The cause of this may not be clear, however it is notable that participation of developed states similar to IOSEA is lacking. That said, France has offered to give financial assistance to the signatory states to the MoU.⁷²

It should be remembered, however, that not all such agreements have been concluded under the auspices of CMS. For example, the SPAW Protocol to the Cartagena Convention, which was discussed in the context of the regional seas programme,⁷³ not only contains obligations relating to protected areas, but also obligations to protect species like turtles in the Wider Caribbean region. However, a far more focused agreement, applicable to the same region, also exists namely the Inter-American Convention for the Protection and Conservation of Sea Turtles (“IAC”).⁷⁴

This agreement was adopted on the 5th September 1996 and entered into force on the 2nd May 2001. According to Wold, the agreement is:

the first attempt to protect sea turtles comprehensively with a legally binding, multilateral treaty.⁷⁵

The convention seeks to promote the protection, conservation and recovery of marine turtle populations and the habitats on which they depend.⁷⁶ These efforts are intended to benefit a number of marine turtle species, including the Loggerhead, Hawksbill

⁷¹ Report of the 12th Meeting of the CMS Scientific Council, Annex 7.

⁷² *Ibid.*

⁷³ See Chapter 6.

⁷⁴ The text of the Convention is reproduced in (2002) 5(1-2) *Journal of International Wildlife Law and Policy* 163.

⁷⁵ C. Wold, “The Status of Sea Turtles under International Environmental Law and International Environmental Agreements” (2002) 5(1-2) *Journal of International Wildlife Law and Policy* 11 at 44.

⁷⁶ IAC, Article II

and Green Turtle,⁷⁷ in the land territory and maritime areas in the states of North, Central and South America, and the Caribbean Sea.⁷⁸ To date, 10 states have signed the convention, with eight having progressed to ratification.⁷⁹

The IAC does oblige parties to take a number of measures towards conserving the habitat of marine turtles. More particularly, Article IV(1) provides that parties shall take appropriate and necessary measures to conserve turtle habitats. These measures shall include:

The protection, conservation and, if necessary, the restoration of sea turtle habitats and nesting areas, as well as the establishment of necessary restrictions on the use of such zones, including the designation of protected areas, as provided in Annex II.⁸⁰

Annex II draws attention to EIA and developments near nesting sites, as well as establishing protected areas and regulating use of areas where turtles occur.

Whilst constraints of space have demanded only a brief recognition of the convention, it is possible to recognise that the IAC, like IOSEA, clearly promotes MPA strategies with the potential for benefiting coral reef ecosystems. In the case of the IAC, however, this is achieved through the medium of a legally binding agreement.

The role of the IAC in the global effort to protect turtles and conserve their habitat has been recognised and relied upon by the CMS as part of achieving that

⁷⁷ IAC, Article I(1) and Annex I.

⁷⁸ IAC, Articles I(4) and II.

⁷⁹ Venezuela, Peru, Brazil, Costa Rica, Mexico, Ecuador, the Netherlands, Honduras and the United States have all ratified the IAC. See www.oceanlaw.net/texts/index2.htm for further information.

⁸⁰ IAC Article IV(2)(d).

convention's objectives. Indeed, CMS recognised that following the adoption of the IAC, together with the SPAW Protocol,⁸¹ IOSEA and the Atlantic Coast of Africa MoU, only "*one vast area remained without international conservation measures for marine turtles: the Pacific Ocean*".⁸² Moves to remedy this under the auspices of CMS are in their infancy. However, the contracting parties at both the 7th and 8th COP have issued a Resolution and a Recommendation calling for Pacific states to conclude an MoU and Conservation Plan for marine turtles in the region.⁸³

4. CONCLUSIONS

This chapter has sought to highlight the fact that the conservation of coral reef ecosystems through MPA strategies may also be promoted under international law in pursuit of a separate end, as opposed to an end in itself. This is revealed when consideration is given to conventions and non-binding arrangements related to the conservation of migratory species. A number of these regimes have been concluded under the auspices of the CMS, and exclusively in the context of global efforts to conserve marine turtles. Extending the influence of such conservation of coral reefs will, in future, depend upon improving levels of understanding on how important coral reef ecosystems are to other migratory species beyond turtles, and then promoting action under CMS towards conserving coral reefs as habitat for these species. As matters stand, however, the conservation of coral reef ecosystems through MPA strategies under CMS, and the other agreements discussed, is limited to marine

⁸¹ 1990 Protocol Concerning Specially Protected Areas and Wildlife to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region. See Chapter 6.

⁸² *Report of the Seventh Meeting of the Conference of the Parties to the Convention on the Conservation of Migratory Species of Wild Animals* at para 148.

⁸³ Resolution 7.7 and Recommendation 8.17.

turtles, and in particular the three species of marine turtle known to depend upon these habitats.

This has severely limited the impact of these agreements to those coral reefs which are actually visited by Loggerhead, Hawksbill and Green Turtles. The impact of this is further exacerbated by the high number of coral reef states which, whilst predominantly range states for marine turtles, are not parties to the CMS or the regional initiatives. It is therefore questioned whether the CMS and the various arrangements concluded either under its auspices or independently can offer sufficient protection for all of the earth's coral reef ecosystems. The inevitable conclusion is that, whilst CMS and arrangements like IOSEA and the IAC will help to promote MPA strategies for the conservation of coral reef ecosystems, their role must remain supportive of, and complementary to, more focused international efforts.

PART IV

CONCLUSIONS

CHAPTER ELEVEN – CONCLUSIONS

1. CORAL REEF ECOSYSTEMS AND MARINE PROTECTED AREA STRATEGIES

– A FORGOTTEN ISSUE?

Warm water coral reef ecosystems play a significant role in sustaining life and in particular the lives of poorer coastal communities in developing countries residing next to marine waters which would otherwise be far less supportive of life. This ranges from being the basis for food supply and tourist industries, to acting as a physical barrier to the force of the ocean. Yet coral reef ecosystems are complex and intricately balanced, making them vulnerable to shaping by anthropogenic factors such as overfishing, pollution and climate change. Establishing marine reserves can address some of these threats, such as those derived from fishing and tourist activities, by enabling management of human use in a sustainable manner. This in turn promotes healthy reefs, which is important as recovery rates from natural and man-made impacts have been observed to be better for such reefs. Whilst marine protected areas (“MPAs”) need to be utilised in conjunction with other strategies to promote the conservation of coral reef ecosystems – such as international efforts to tackle climate change, and coastal zone management – MPAs remain a key component in national environmental planning.

Ensuring that appropriate areas of coral reef are conserved within such enclaves, and that management plans for MPAs are drawn up and actually implemented, is an ongoing concern of the international community. As discussed at the start of Part III, international law can play an important role in this regard, particularly with respect to reducing the number of paper parks. However, at the beginning of this research into

the way in which international law promotes the conservation of coral reef ecosystems through MPA strategies, the author had concerns about the likelihood of there being an absence of law on the issue. An attempt to draw together disparate strands under global conventions dealing with aspects of habitat conservation was anticipated. Dimitrov, after all, believed it was valid to ask why an international treaty (or set of treaties) for coral reef management was absent from the global agenda in 2002, and why coral reef decline was being ignored by international law.¹

Completion of this study has served to highlight that these personal concerns were misplaced, and that, in fact, the opposite situation exists. Coral reef conservation is increasingly on the agenda of multilateral environmental agreements ("MEAs"), and MPAs are often promoted as a strategy for the conservation of these habitats. The extent of the law is such that lawyers are more likely to encounter replication of efforts under separate regimes, rather than lacunae in the system. The absence of moves towards a focused convention or protocol for coral reef ecosystems (which it is expected would include elements on MPA strategies) might therefore be partly due to legal provisions already being sufficient thereby discouraging initiation of further time-consuming, expensive and uncertain negotiations. It is certainly this author's opinion that the current law offers adequate means for the promotion of coral reef ecosystems through MPA strategies.

Such a proposition is supported in this study in the light of the first detailed assessment of the five, pertinent, global conventions. This assessment has identified the ways in which the conservation of coral reef ecosystems through MPA strategies

¹ R. S. Dimitrov, "Confronting Nonregimes: Science and International Coral Reef Policy" (2002) 11(1) *Journal of Environment & Development* 53 at 53.

have been incorporated within the jurisdiction of such arrangements, and has also revealed the strengths and weaknesses of each from this thesis' focused perspective.

2. THE GLOBAL CONVENTIONS

Five global conventions were identified as having the potential to promote MPA strategies for the conservation of coral reef ecosystems. This study therefore embarked on a process of assessing whether coral reefs as a habitat did indeed fall within their jurisdiction, and if so, to what extent enclave strategies and coral reef conservation were advanced. In the light of this, and whilst all of the conventions did indeed have a bearing upon the focus of this study, the Convention on Biological Diversity ("CBD") and the Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat ("Ramsar") have shown themselves to be more at the forefront of international law on coral reef conservation through MPAs than others.

2.1 THE LAW OF THE SEA

Investigations into the 1982 United Nations Convention on the Law of the Sea ("LOSC") and the 1979 Convention on the Conservation of Migratory Species of Wild Animals ("CMS") demonstrated the more peripheral nature of the contribution of each of these treaties. With respect to the former, the LOSC simply provides a general framework for promoting conservation of reef habitats through MPAs. This is in contrast to its detailed treatment of pollution threats to the marine environment which are either, in the case of vessel source pollution, of lesser impact on coral reefs, or, in the case of land-based sources of pollution, cannot be controlled by MPA strategies. This is not to say that land-based sources of pollution cannot undermine the fulfilment of management objectives for MPAs, and MPA strategies must ultimately

be nested within wider environmental policies co-ordinated through integrated coastal zone management.

With respect to promoting MPA strategies for coral reef ecosystems, the LOSC therefore envisages and relies upon action under regional arrangements or other global MEAs, albeit that such initiatives must accord with its other provisions, such as those governing the powers of coastal states in Internal Waters, the Territorial Sea, the Exclusive Economic Zone and the High Seas. In that regard, an account has been given of the general compatibility of these maritime zone regulations with MPA strategies.

Further, time has been spent exploring the various regional seas initiatives. These regional associations do cover the vast proportion of areas of coral reef in the world, although progress towards agreeing legal commitments for the promotion of MPA strategies for the conservation of these habitats is highly varied, resulting in large lacunae. Some have proceeded to agree protocols focused upon deploying protected areas for the conservation of marine habitats such as coral reefs, whilst others have failed to progress beyond mere statements of general intent in the form of action plans.

Finally, even when such protocols have been, or could be, agreed, it is doubted whether regional initiatives represent the best way to mobilise international support, or reflect the international community's interest in conserving coral reefs because of the common concern of mankind; hence the favouring of this study of global conventions. This is not to say regional initiatives are inappropriate for marine environment issues in all cases; rather that they may not be the right way forward with respect to conserving coral reefs. Therefore, whilst some regional initiatives should

not be ignored on account of the protocols which have been concluded which contain detailed obligations based upon modern scientific thinking for promoting MPAs, collectively they do not offer a complete, and arguably appropriate, response to the need to promote the use of MPAs for coral reef ecosystem conservation.

2.2 PROTECTING THE HABITAT OF MIGRATORY SPECIES

The CMS promotes the conservation of habitats upon which many migratory species rely. The convention is therefore an indirect contributor to international efforts to conserve coral reef ecosystems. Further, the promotion of MPAs as a strategy towards this end is not explicitly contained in the convention's provisions and instead is advanced through recommendations and resolutions agreed by the contracting parties, and through the regional arrangements which have been concluded under the convention's auspices.

In addition, the extent to which areas of coral reef might enjoy the benefits of conservation efforts under the CMS is currently limited in accordance with the habits of just three species of marine turtle, and by the limited number of coral reef states which are engaging in the CMS process and that being conducted under the IOSEA Memorandum of Understanding. Whether the role of the CMS can ever become greater is also hard to predict given the limited knowledge of the role coral reefs play as habitat for other migratory species. Whilst the analysis of the CMS has served to demonstrate how conventions might indirectly contribute to international efforts to promote MPAs as a coral reef ecosystem conservation strategy, the convention's role is currently very limited.

2.3 CORAL REEFS AS NATURAL HERITAGE OF OUTSTANDING UNIVERSAL VALUE

Despite these findings in relation to the LOSC and CMS, the research into the Convention Concerning the Protection of the World Cultural and Natural Heritage (“WHC”) demonstrated this regime’s greater significance for the purposes of this study. The convention boasted almost universal participation by states endowed with coral reefs, as well as a system which directly promotes MPA strategies for coral reef ecosystem conservation. The WHC’s major contribution in this regard relates to enhancing management standards as a result of the availability of international aid, and one of the stronger monitoring systems in international environmental law. In addition, following the Hanoi Statement, direct efforts have been made to increase the representation of coral reef areas on the World Heritage List.

Despite this, analysis of the number of coral reef sites which had actually been inscribed onto the World Heritage List revealed a low total (18 compared to Ramsar’s 54), whilst the time-scale for listing properties suggested that there might be difficulties in using the convention to react fast enough to offer the benefits of international recognition to coral reefs. Further, management tools to help implement the convention’s conservation and protection obligations were lacking, whilst a formalised reporting structure was in its infancy.

Of more fundamental importance, however, was the inherent exclusiveness of the convention to only the most outstanding examples of coral reef ecosystems. Therefore, the convention’s jurisdiction will always exclude large areas of the earth’s coral reefs, irrespective of whether all qualifying reefs are ever nominated and inscribed on the World Heritage List.

As a result, the authority and pro-active stance of the World Heritage Committee, coupled to the financial benefits on offer under the regime must be recognised as an important option for enhancing the management of MPAs for the benefit of a select number of coral reefs. The international community should therefore be alert to taking such options by way of 'added value' to policies pursued under the CBD and/or Ramsar. Nevertheless, this study recognises that the convention does not on its own offer a comprehensive international legal regime for promoting MPA strategies for the conservation of coral reef ecosystems.

2.4 CORAL REEFS AS A FOUNDATION OF MARINE BIODIVERSITY

The CBD has succeeded in garnering the support of a large number of states, including almost all coral reef nations, within a single treaty regime which has been charged with a comprehensive agenda for, *inter alia*, conserving biodiversity and ensuring the sustainable use of its components, including corals and the other components that make up the ecosystem. However, this success throws up particular problems for the regime as a whole, such as focusing the agenda in a detailed and meaningful way, managing external relations with other MEAs and garnering consensus among so many contracting parties in what has historically been a highly politicised negotiating environment.

Consequently a concern exists that the CBD's programmes which promote the use of MPAs as a way to conserve coral reef ecosystems could get lost in the welter of other agenda items and in the face of stretched resources. Recent developments within these programmes of work suggest that (perhaps belatedly) action has been taken to avoid this problem since the initial, predominantly descriptive, policy formulation stage is now being developed through detailed goal and target setting. For example, the

CBD's desired network of effectively managed MPAs by 2012, if achieved, could have far reaching benefits for coral reef ecosystems. Such goals and targets will also enable the regime to better monitor implementation. This represents much needed progress, even if the current targets are incomplete and drafted in worryingly flexible terms.

Success in meeting these targets may, however, turn on a number of key factors, including increasing capacity in financial, institutional and human terms. Further, the CBD will need to find a way to effectively bring about action and assess progress in a regime averse to international monitoring, and lacking tools such as lists of protected areas.

Overall, and following these recent developments, the CBD is seeking to achieve much which can benefit the conservation of coral reefs through the use of MPAs. Nevertheless, whilst amounting to a comprehensive approach covering all coral reefs, the CBD may not be agile enough because of its wider remit and political factors, nor suitably equipped as a regime, to achieve its goals for MPAs without direct assistance from other MEAs. It is in this regard that the Ramsar Convention comes to the fore in terms of promoting MPA strategies for conserving coral reef ecosystems.

2.5 CORAL REEFS AS WETLANDS

MPAs are an integral part of the Ramsar framework for conserving wetlands, both in terms of being explicitly promoted in the convention's provisions, and in the operation of the List of Wetlands of International Importance. That said, Ramsar's predominant contribution to such strategies seems to lie in enhancing the management and running of such protected areas, rather than acting as a catalyst for the establishment of new marine parks.

To the extent that the convention therefore considers coral reefs to be wetlands, and to the extent that the conservation of these habitats is promoted, MPAs will play a key role. This study's analysis of the convention in these regards provided justifications for including these habitats within the convention's definition of wetlands, whilst also highlighting the potentially comprehensive coverage of the treaty – provided participation of coral reef states continued to improve from the already healthy number with control over 83% of the world's coral reefs. Thereafter, Ramsar has been active in promoting the conservation of coral reefs amongst its constituents, particularly since the early 1990's, and this promotion has coincided with an increasing number of coral reefs being included in wetlands inscribed on the Ramsar List as being internationally important. Significantly, and in contrast to the WHC, Ramsar does not limit its application to an exclusive group of sites admitted to the list, but also applies the 'wise use' obligation to all wetlands, and therefore all coral reefs of contracting parties.

Ultimately it is clear that Ramsar is actively trying to help coral reef ecosystems and is generating a response from contracting parties. This in turn has positive implications for the promotion of MPAs as a strategy for conserving these habitats.

2.6 THE STATE OF INTERNATIONAL LAW AND THE PROMOTION OF MPAS FOR THE CONSERVATION OF CORAL REEF ECOSYSTEMS

The principal contribution of this thesis to the international environmental law project lies in the above identification, detailed description and assessment of the current body of international law and how it is promoting the use of MPAs for coral reef ecosystem conservation. Instead of a disparate collection of norms which it is difficult to pull close enough together to offer any semblance of order for promoting such

conservation, between the CBD and Ramsar the global community actually has two adequate normative bases covering coral reef ecosystems both in terms of mandate and geographic coverage. The promotion of MPA strategies for the conservation of these habitats are an important element in their operation, particularly under Ramsar. Where it is an option, it is also possible to add further value to international efforts to conserve these habitats particularly through World Heritage listing, and again this is achieved through the deployment of MPAs. This suggests that a bespoke, sectorial convention for coral reefs, or even tropical marine ecosystems, is unnecessary and the luxury such an agreement might offer does not merit the time and costs required for such a project, nor justify the additional administrative burden upon contracting states. That said, there remain weaknesses in the current body of law which should shape the future direction of international efforts to conserve these important ecosystems through enclave strategies. These can be generally grouped under the headings of capacity and co-ordination.

3. FUTURE NEEDS: CAPACITY

This study began by highlighting two problems with respect to MPA strategies and coral reef conservation. The first was a lack of coverage in spatial terms resulting in a call for more reserves to be created. The second issue was that, even when states have designated protected areas, failure to implement management plans, enforce laws and regulations aimed at promoting conservation, and to have enough trained personnel to run protected area programmes, has generated the 'paper parks' problem. These two problems relate to capacity in the sense of (i) having enough area of coral reef protected to ensure the continued functioning of these ecosystems and the provision of the benefits noted in Chapter 3, and (ii) having enough financial and personnel

resources to manage protected area programmes in a way which achieves their conservation objectives. This study would also supplement these two aspects of capacity with a third, namely increasing legal understanding and knowledge. This study's review of the current body of international law has thrown up some positives in terms of tackling these problems of capacity, but there are a number of limits which could and should be addressed as part of the international community's future activity with respect to coral reef conservation.

3.1 SPATIAL CAPACITY

In the current context, this problem refers more to the area of coral reef contained within designated MPAs, rather than the geographic capacity of international conventions through state membership. As has been noted, this latter aspect is very positive under current international law when membership of the CBD is recalled, and even with respect to Ramsar. Nevertheless, a number of calls for the designation of more MPAs and the creation of networks of larger enclaves have been reported by the likes of Wilkinson,² and Roberts,³ but the analysis in this study suggests that this is where international environmental law seems to be failing. Both Ramsar and the WHC employ MPAs as a key component in their mechanisms for promoting conservation of coral reef ecosystems, yet this study has been unable to unearth significant evidence that the designation and inscription of enclaves under these conventions has involved locations which were not already well established protected areas. What remains in terms of international law seeking to build this type of capacity is the vague aspirational call under the CBD for 10% of each marine and

² C. Wilkinson, *Status of Coral Reefs of the World: 2004 Executive Summary* (GCRMN) (2004) at 34.

³ C. M. Roberts *et al*, "Redesigning coral reef conservation" in I. Côté and D. Reynolds, *Coral Reef Conservation* (CUP) (2006) 515 at 518-520.

coastal ecological region to be effectively conserved by 2010, and a record of the fact that the contracting parties have, so far, been unable to accept a target of 30% of all known tropical and cold water coral reefs and seamounts being effectively managed through MPAs or other state controls within the same timeframe.

Therefore, the failings of international environmental law to increase capacity in terms of MPA coverage of coral reef ecosystems needs to be confronted, and addressed. This, in part, will involve the third notion of capacity building proposed above, namely improving understanding of international law. More research needs to be conducted into understanding the reasons why conventions such as Ramsar and the WHC are apparently unable to catalyse the creation of new MPAs for the conservation of coral reef ecosystems.

3.2 MANAGEMENT CAPACITY

Whilst it has been suggested that current international law does not increase spatial capacity, this study does seem to be able to say that international law is set up to improve management. Such characteristics were discussed in Chapter 5 with regards to the benefits of involving international law and then highlighted by reference to the provisions of the various conventions – e.g. putting experts in contact with each other, exposing national programmes to scrutiny thereby encouraging heightened commitment to conservation efforts, and providing mechanisms for funding streams. It is in this regard that the added value of the WHC seemed to be most apparent, given the incentives for demonstrating good management of sites, the strength of the monitoring regime under the convention, and the availability of funding and support for training programmes and buying equipment. Nevertheless, what reports there are from contracting parties to the CBD, Ramsar and the other conventions seem to

indicate that there is still a shortfall in terms of the equipment, money, and personnel needed. This has to be one of the priority areas for the future development of Ramsar and the CBD's activities, especially since the benefits which the WHC system offers in this regard can only be unlocked by a few coral reef areas.

3.3 BUILDING CAPACITY IN TERMS OF LEGAL KNOWLEDGE AND UNDERSTANDING

The above sections have highlighted a couple of areas where legal understanding needs to be improved, i.e. why are the MEAs failing to improve management and spatial capacity? However, this study has noted a few others which, if addressed, could also help MPA managers and contracting parties implement international legal obligations more successfully.

The most obvious relates to the production of guidelines for the *meeting of legal* obligations. Fortunately one of the key conventions for the promotion of MPAs as a strategy for the conservation of coral reef ecosystems is particularly strong in this regard. The Ramsar Convention has produced 28 guideline publications which help the contracting parties to understand (i) key legal obligations (e.g. the three volumes of guidelines on the wise use concept), (ii) conservation practices (e.g. the guidelines on wetland restoration), and (iii) the future direction of the convention (e.g. the guidelines for developing the wetlands list).⁴ The convention therefore builds capacity with regards to legal knowledge and understanding, as well as increasing management capacity. This is because the guidelines help governments and those responsible for running wetland protected areas by sharing knowledge and advice on conservation techniques (thereby improving management capacity), and also to build capacity in terms of national understanding of the legal demands of the convention.

⁴ The full list and text of the guidelines can be found at www.ramsar.org/key_guidelines_index.

The remaining conventions considered in this study should reflect upon the guidance they have produced on implementing the legal obligations they impose and on conservation techniques tailored to their objectives. For example, it was suggested in the chapter on the WHC that what guidance there was produced under that regime might not be sufficient. Notably, and despite the *Operational Guidelines for the Implementation of the World Heritage Convention*, it was difficult to establish what was expected of the parties under obligations to 'conserve' and 'protect' natural heritage. This was something of an issue given the strong compliance regime which backed up the convention's operation through reactive monitoring mechanisms. If the WHC were to be advocated as a means for 'adding value' to efforts to conserve coral reef ecosystems through MPAs, then the standards of conservation and protection need to be made clearer, so that contracting parties can be judged against transparent criteria under the monitoring system being used.

Guidelines can therefore improve legal knowledge, as well as management capacity. However, there is another area, identified during the course of this study, where the former needs to be improved. This relates to the distribution of coral reefs between the maritime zones. This study has had to make an educated guess as to the likely distribution, but accurate data would be valuable. Kelleher noted that only 15 MPAs were known to exist in the Exclusive Economic Zone in 1995.⁵ If there is still (11 years later) such an inshore tendency for MPAs in territorial or inland waters, perhaps for practical or legal reasons, how significant is this for the conservation of coral reefs? Views on this can only be reached in the light of accurate data on their distribution relative to the legal boundaries established under the LOSC.

⁵ G. Kelleher, *Guidelines for Marine Protected Areas* (IUCN) (1995) at 8.

4. FUTURE NEEDS: CO-ORDINATION

At the end of part 2 above it was repeated how the promotion of MPA strategies for the conservation of coral reef ecosystems can now be seen as being potentially dealt with in a comprehensive manner under two treaties, namely the CBD and the Ramsar Convention. The option is also available for these initiatives to receive 'added value' from developments under the WHC, and to a restricted extent under the CMS through the IOSEA Memorandum of Understanding.

Thus, whilst the promotion of such strategies for coral reefs does not suffer from fragmentation between varying regimes requiring different elements to be drawn together,⁶ an element of co-ordination between the treaties and agreements is needed in the future in order to achieve coherent implementation through the efficient use of limited resources. Finding and designating an appropriate body to co-ordinate these efforts should therefore be a priority. That said, a suitable channel may already be available.

It is at this point that Chapter 5 should be recalled and its coverage of the Biodiversity Liaison Group (the "BLG"). As stated, in June 2004, Executive Secretaries and high level representatives from the CBD, Ramsar, WHC, CMS and the Convention on International Trade in Endangered Species, attended the first meeting of the BLG. That meeting was organised by the CBD in response to a decision, made by the contracting parties to the treaty,⁷ urging the formation of a liaison group to enhance

⁶ Contrast this general conclusion to that reached in relation to the environmental protection of mountain areas, where no comprehensive regime existed covering all mountain areas, and beneficial obligations for these habitats were fragmented between different treaties. A. Fodella and L. Pineschi, "Environmental Protection and Sustainable Development of Mountain Areas" in T. Treves *et al* (eds.), *International Law and Protection of Mountain Areas* (2002) (Giuffr ) 15.

⁷ Decision VII/26.

co-operation and coherence between the biodiversity related conventions. A number of further meetings have since taken place.

In Chapter 5, it was mentioned how the initial work of the BLG has focused upon the CBD's targets on biodiversity and the ways in which all of the conventions can contribute towards achieving these aims, and monitor and share data on progress through their compliance mechanisms. It therefore seems that a number of factors are now coming together which could be used by the BLG to begin a co-ordinated implementation of the law as it relates to the promotion of MPAs for the conservation of coral reef ecosystems.

First, coral reef conservation is increasingly being promoted under the global conventions through such strategies, and against the backdrop of heightened public awareness and appreciation of these ecosystems. This development, though, could easily result in replication of effort (for example in terms of reporting back to convention secretariats) and therefore warrants attention from the BLG given its responsibilities.

Second, the latest round of COPs and meetings supports greater interaction to co-ordinate efforts. For example, at the 9th COP to Ramsar, the contracting parties pressed for more collaboration between conventions,⁸ and the development of a broader network of protected areas utilising Ramsar, WHC and UNESCO Biosphere Reserves.⁹

This all coincides with the BLG beginning discussions on possible joint work plans for the group operating in the period beyond the CBD's biodiversity targets for

⁸ Resolution IX.5.

⁹ Resolution IX.22.

2010.¹⁰ This joint work plan might therefore be the most important opportunity of recent times to begin the process of co-ordinating the international law relating to the conservation of coral reef ecosystems through MPA strategies.

Formulating such a joint work plan for MPAs and coral reef ecosystems could, ultimately, take a number of forms, but acceptance by all the regimes of the various capacities of the conventions represented on the BLG and those currently outside of the group, will be important.

Such agreed co-operation would also see the relationship between the CBD and the WHC, Ramsar and CMS continue to develop in the direction already advocated in this study. It has been suggested that the CBD was initially motivated by a desire for an all-encompassing framework convention for biodiversity conservation, which could also lead to the creation of more focused protocols. The decision was also made early on that the pre-existing sectorial treaties could not be rationalised into the CBD, and would continue to exist independently. Nevertheless, given the significance of the CBD and the number of states which were party to this convention, the treaties which pre-dated the CBD's introduction have adapted to its introduction and vocabulary. This study, however, now suggests that the CBD needs the assistance of these regimes to achieve its own objectives, with coral reef conservation being an illustration of this fact. Out-sourcing responsibility for particular aspects of biodiversity management, such as coral reef conservation, to the pre-existing conventions via joint work plans seems an appropriate step. This is perfectly acceptable if all involved are coming together and co-ordinating their work through the BLG, especially since the objections to sectorial regimes are weaker if the ecosystem perspective can be advanced through such a multi-regime forum.

¹⁰ See Report of the 4th Meeting of the Biodiversity Liaison Group, October 2005.

In drawing this study to a close, efforts have been made herein to commence such discussions on the way this delegated but co-ordinated approach could be formulated via a better understanding of the satisfactory extent of the law available, as well as the strengths and limitations of the conventions operating in this field. As matters therefore stand, the future needs of international environmental law for coral reef conservation through MPA strategies are improving capacity and co-ordination, rather than the negotiation of new treaties or protocols.

PART V

APPENDICES

APPENDIX I

CORAL REEF STATES AND CONVENTION PARTICIPATION

The table presented in this appendix has been compiled using data drawn from:

- (1) "New Atlas Maps the World's Fast Disappearing Coral Reefs", *UNEP-WCWC Press Release*, 11 September 2001.
- (2) M. D. Spalding *et. al.*, *World Atlas of Coral Reefs*, (Berkeley : University of California) (2001); and
- (3) Records of the MEAs considered in this study.

The first of these sources provides percentages for global coral reef occurrence in 80 states, although three states which could have been included appear to have been omitted. These three states which are noted in the remaining two sources identified above are included at the end of the table. Therefore, for the purposes of this study, all figures quoted as to membership of coral reef states are based upon the larger number (83), whilst the equivalent percentage of global coral reefs falling within the apparent jurisdiction of MEAs are given as estimates based upon the UNEP press release figures. Given the small area of coral reef found in the states omitted, any such figures quoted remain pertinent.

Country	% of global reef coverage	UNCLOS	CBD	Ramsar	World Heritage Convention	CMS	IOSEA
Indonesia	17.95	✓	✓	✓	✓		✓
Australia	17.22	✓	✓	✓	✓	✓	✓
Philippines	8.81	✓	✓	✓	✓	✓	✓
France	5.02	✓	✓	✓	✓	✓	
Papua New Guinea	4.87	✓	✓	✓	✓		
Fiji	3.52	✓	✓	✓	✓		
Maldives	3.14	✓	✓		✓		
Saudi Arabia	2.34	✓	✓		✓	✓	✓
Marshall Islands	2.15	✓	✓	✓	✓		
India	2.04	✓	✓	✓	✓	✓	
Solomon Islands	2.02	✓	✓		✓		
United Kingdom	1.94	✓	✓	✓	✓	✓	✓
Micronesia	1.53	✓	✓		✓		
Vanuatu	1.45	✓	✓		✓		
Egypt	1.34	✓	✓	✓	✓	✓	
United States of America	1.33			✓	✓	✓	✓
Malaysia	1.27	✓	✓	✓	✓		
Tanzania	1.26	✓	✓	✓	✓	✓	✓
Eritrea	1.15		✓		✓	✓	
Bahamas	1.11	✓	✓	✓			
Cuba	1.06	✓	✓	✓	✓		
Kiribati	1.03	✓	✓		✓		
Japan	1.02	✓	✓	✓	✓		
Sudan	0.96	✓	✓	✓	✓		
Madagascar	0.78	✓	✓	✓	✓		✓
Thailand	0.75		✓	✓	✓		✓
Myanmar	0.66	✓	✓	✓	✓		✓

Country	% of global reef coverage	UNCLOS	CBD	Ramsar	World Heritage Convention	Bonn Convention	IOSEA
Mozambique	0.65	✓	✓		✓		
Mexico	0.63	✓	✓	✓	✓		
Seychelles	0.59	✓	✓	✓	✓	✓	✓
China	0.53	✓	✓	✓	✓		
Tonga	0.53	✓	✓		✓		
Belize	0.47	✓	✓	✓	✓		
New Zealand	0.46	✓	✓	✓	✓	✓	
Viet Nam	0.45	✓	✓	✓	✓		✓
Jamaica	0.44	✓	✓	✓	✓		
Brazil	0.42	✓	✓	✓	✓		
United Arab Emirates	0.42		✓		✓		
Palau	0.40	✓	✓	✓	✓		
Spratly Islands	0.40		✓				
Costa Rica	0.34	✓	✓	✓	✓		
Colombia	0.33		✓	✓	✓		
Taiwan	0.33		✓				
Mauritius	0.31	✓	✓	✓	✓	✓	✓
Honduras	0.28	✓	✓	✓	✓		
Panama	0.25	✓	✓	✓	✓	✓	
Nicaragua	0.25	✓	✓	✓	✓		
Somalia	0.25	✓				✓	
Tuvalu	0.25	✓	✓				
Iran	0.25		✓	✓	✓		✓
Qatar	0.25	✓	✓		✓		
Yemen	0.25	✓	✓		✓		
Sri Lanka	0.24	✓	✓	✓	✓	✓	✓
Kenya	0.22	✓	✓	✓	✓	✓	✓

Country	% of global reef coverage	UNCLOS	CBD	Ramsar	World Heritage Convention	Bonn Convention	IOSEA
Dominican Republic	0.21		✓	✓	✓		
Bahrain	0.20	✓	✓	✓	✓		
Oman	0.19	✓	✓		✓		✓
Western Samoa	0.17	✓	✓	✓	✓		
Venezuela	0.17		✓	✓	✓		
Netherlands	0.17	✓	✓	✓	✓	✓	
Djibouti	0.16	✓	✓	✓		✓	
Haiti	0.16	✓	✓		✓		
Comoros	0.15	✓	✓	✓	✓		✓
Antigua and Barbuda	0.08	✓	✓	✓	✓		
Brunei Darussalam	0.07	✓					
St Kitts and Nevis	0.06	✓	✓		✓		
St Lucia	0.06	✓	✓	✓	✓		
Grenada	0.05	✓	✓		✓		
St Vincent and Grenadines	0.05	✓	✓		✓		
Kuwait	0.04	✓	✓		✓		
Barbados	<0.035	✓	✓	✓	✓		
Dominica	<0.035	✓	✓		✓		
Singapore	<0.035	✓	✓				
Trinidad and Tobago	<0.035	✓	✓	✓	✓		
Bangladesh	<0.018	✓	✓	✓	✓		✓
Cambodia	<0.018		✓	✓	✓		✓
Ecuador	<0.018		✓	✓	✓	✓	
Jordan	<0.018	✓	✓	✓	✓	✓	✓
Nauru	<0.018	✓	✓				
Israel	<0.003		✓	✓	✓	✓	
South Africa	unknown	✓	✓	✓	✓		✓

Country	% of global reef coverage	UNCLOS	CBD	Ramsar	World Heritage Convention	Bonn Convention	IOSEA
Guinea	unknown	✓	✓	✓	✓	✓	
Equatorial Guinea	unknown	✓	✓	✓			
	<i>TOTAL %</i>	94.62	98.35	83.43	97.37	45.2	54.16 ¹

¹ This figure does not include the USA, the vast majority of whose reefs lie outside of this region.

APPENDIX II

BIBLIOGRAPHY

- A. Alcala *et al.*, “Collaborative and community-based conservation of coral reefs, with reference to marine reserves in the Philippines” in I. Côté and J. Reynolds (eds), *Coral Reef Conservation* (CUP) (2006) 392.
- H. Ansari and P. Jamal, “The Convention on Biological Diversity: A Critical Appraisal with Special Reference to Malaysia” (2000) 40 *Indian Journal of International Law* 137.
- T. Arin and R. A. Kramer, “Divers’ Willingness to Pay to Visit Marine Sanctuaries: an Exploratory Study” (2002) 45 *Ocean & Coastal Management* 171.
- T. Atherton and T. C. Atherton, “The Power and the Glory: National Sovereignty and the World Heritage Convention” (1995) 69 *The Australian Law Journal* 631.
- A. Aust, *Modern Treaty Law and Practice* (CUP) (2000).
- T. Austin *et al*, *The Exploitation of Coral Reefs*, (Field Studies Council) (1996).
- A. Balmford *et al*, “The worldwide costs of marine protected areas” [2004] 101 (26) *PNAS* 9694.
- S. Barrett, *Environment & Statecraft* (OUP) (2003)
- P. B. Beazley, “Reefs and the 1982 Convention on the Law of the Sea” (1991) 6(4) *International Journal of Estuarine and Coastal Law* 281.

- R. Berkelmans and M. J. H. van Oppen, "The Role of Zooxanthellae in the Thermal Tolerance of Corals: A 'Nugget of Hope' for Coral Reefs in an Era of Climate Change" 2006 *Proceedings of the Royal Society B* 1 (advanced publication online at www.journals.royalsoc.ac.uk)
- P. Birnie, "The Challenges of Applying UNCLOS in a Post UNCED Context" in J. Norton *et al* (eds), *The Changing World of International Law in the Twenty-First Century* (Kluwer) (1998) 4.
- P. Birnie and A. Boyle, *International Law and the Environment*, (OUP) (2002, 2nd Ed.).
- A. Blanco-Bazán, "The Environmental UNCLOS and the Work of IMO in the Field of Prevention of Pollution from Vessels" in A. Kirchner (ed), *International Marine Environmental Law – Institutions, Implementation, and Innovations* (Kluwer) (2003) 31.
- M. J. Bowman, "Global Warming and the International Legal Protection of Wildlife" in R. Churchill and D. Freestone (eds), *International Law and Global Climate Change* (Graham & Trotman) (1991) 127.
- M. J. Bowman, "The Ramsar Convention Comes of Age" (1995) 42 *Netherlands International Law Review* 1.
- M. J. Bowman, "The Ramsar Convention on Wetlands: Has it Made a Difference" in *Yearbook of International Co-operation on Environment and Development 2002/2003* (Earthscan) (2002) 61.
- A. Boyle, "The Rio Convention on Biological Diversity" in Bowman and Redgwell (eds), *International Law and the Conservation of Biological Diversity* (Kluwer) (1996) 33.

- L. Browning *et al.*, “Education as a tool for coral reef conservation: lessons from marine protected areas” in I. Côté and J. Reynolds, *Coral Reef Conservation* (CUP) (2006) 419.
- I. Brownlie, *Principles of Public International Law* (OUP) (2003, 6th Ed.).
- D. Bryant, *Reefs at Risk – a Map-Based Indicator of Threats to the World’s Coral Reefs* (WRI) (1998).
- F. Burhenne-Guilmin and S. Casey-Lefkowitz, “The Convention on Biological Diversity : A Hard Won Global Achievement” (1992) 3 *YIEL* 43.
- C. Cameron, “The Strengths and Weaknesses of the World Heritage Convention” (1992) 28(3) *Nature & Resources* 18.
- N. Chadwick-Furman, “Reef coral diversity and global change” (1996) 2 *Global Change Biology* 559.
- M. Chandler, “The Biodiversity Convention: Some Selected Issues of Interest to the International Lawyer” (1993) 4 *Col. JIEL&P* 141.
- J. I. Charney, “The Marine Environment and the 1982 United Nations Convention on the Law of the Sea” (1994) 28(4) *The International Lawyer* 879.
- R. R. Churchill and A. V. Lowe, *The Law of the Sea* (Manchester University Press) (1999, 3rd Ed.).
- T. A. Clingan, *The Law of the Sea: Ocean Law and Policy* (Austin & Winfield) (1994).

- A. Cohen and M. McCartney, *Seasonally Resolved Records of Surface Ocean Conditions in Brain Coral from Bermuda* (1999) in Papers on Atlantic Climate Variability, Atlantic Climate Change Program, Office of Global Programs, NOAA available at www.aoml.noaa.gov/phod/acvp/cohen.htm.
- E. Corcoran and S. Hain, "Cold-water coral reefs: status and conservation" in I. Côté and J. Reynolds (eds), *Coral Reef Conservation* (CUP) (2006) 115
- R. Costanza *et. al.*, "The Value of the World's Ecosystem Services and Natural Capital" (1997) 387 *Nature* 253.
- M. G. Davidson, "Protecting Coral Reefs: the Principal National and International Legal Instruments" (2002) 26 *Harv. ELR* 499.
- D. Davies and C. Tisdell, "Recreational scuba-diving and carrying capacity in MPAs" (1995) 26(1) *Ocean & Coastal Management* 19.
- J. Davies (ed), "Invasive Species: Their Threat to MPAs, and How Practitioners are Responding" (2005) 6(6) *MPA News* 1.
- A. C. de Fontaubert, D. R. Downes and T. S. Agardy, *Biodiversity in the Seas: Implementing the Convention on Biological Diversity in Marine and Coastal Habitats* (IUCN) (1996).
- C. de Klemm, "Migratory Species in International Law" (1989) 29 *Natural Resources Journal* 935.
- C. de Klemm, "The Problem of Migratory Species in International Law" (1994) *Green Globe Yearbook* 67.
- C. de Klemm and C. Shine, *Biological Diversity Conservation and the Law* (IUCN) (1993).

- R. S. Dimitrov, “Confronting Nonregimes: Science and International Coral Reef Policy” (2002) 11(1) *Journal of Environment & Development* 53.
- H. K. Eidsvik, “The World Heritage Convention, Yesterday – Today – and Tomorrow. An Overview” in Workshop Papers from the 18th General Assembly of IUCN, *Critical Issues for Protected Areas Part 1: World Heritage Session* (IUCN) (1990) 15.
- R. Endean, “Destruction and recovery of coral reef communities” in O. Jones and R. Endean (eds), *Biology and Geology of Coral Reefs Vol. 3* (Academic Press) (1976) 215.
- K. Fabricius, “Effects of terrestrial runoff on the ecology of corals and coral reefs: review and synthesis” (2005) 50 *Marine Pollution Bulletin* 125.
- R. Falk and H. Elver, “Comparing Global Perspectives: The 1982 UNCLOS and the 1992 UNCED” in Vidas and Østreng (eds), *Order for the Oceans at the Turn of the Century* (Kluwer) (1999) 145.
- D. Farrier and L. Tucker, “Wise Use of Wetlands Under the Ramsar Convention: A Challenge for Meaningful Implementation of International Law” (2000) 12(1) *JEL* 21.
- R. Feely *et al*, “Impact of Anthropogenic CO₂ on the CaCO₃ System in the Oceans” (2004) 305 *Science* 362.
- G. Fitzmaurice, “The Law and Procedure of the International Court of Justice 1951-4: Treaty Interpretation and Other Treaty Points” (1957) 33 *B.Y.I.L.* 203
- M. Fitzmaurice, “The Practical Working of the Law of Treaties” in M. D. Evans, *International Law* (OUP) (2003) 173.

- A. Fodella and L. Pineschi, “Environmental Protection and Sustainable Development of Mountain Areas” in T. Treves *et al* (eds.), *International Law and Protection of Mountain Areas* (2002) (Giuffré) 15
- E. Frankx, “Regional Marine Environmental Protection Regimes in the Context of UNCLOS” (1998) 13(3) *International Journal of Marine & Coastal Law* 307.
- D. Freestone, “Specially Protected Areas and Wildlife in the Caribbean – The 1990 Kingston Protocol to the Cartagena Convention” (1990) 5(4) *International Journal of Estuarine & Coastal Law* 362.
- A. Freiwald *et al*, *Cold Water Coral Reefs: Out of Sight – No Longer Out of Mind* (UNEP-WCMC Biodiversity Series) (2004).
- K. J. Gaston and J. I. Spicer, *Biodiversity: An Introduction* (Blackwell) (2004).
- A. Gillespie, *International Environmental Law Policy and Ethics* (OUP) (1997).
- L. Glowka, F Furhenne-Guilmin and H Synge in collaboration with J A McNeely and L Gündling, *A Guide to the Convention on Biological Diversity - Environmental Policy and Law Paper No. 30* (IUCN) (1994).
- E. J. Goodwin, “Conservation of Coral Reefs Under the Ramsar Convention on Wetlands” (2006) 9(1) *Journal of International Wildlife Law & Policy* 1.
- D. J. Haigh, “World Heritage – Principle and Practice: a Case for Change” (2000) 17(3) *Environmental and Planning Law Journal* 199.
- L. Hansen, “Increasing the resistance and resilience of tropical marine ecosystems to climate change” in L. Hansen, J. Biringer and J. Hoffman (eds), *Buying Time: A user’s manual for building resistance and resilience to climate change in natural systems* (WWF) (2003) 157.

- D. J. Harris, *Case and Materials on International Law* (Sweet & Maxwell) (1998, 5th Ed.).
- B. G. Hatcher *et al*, “Review of Research Relevant to the Conservation of Shallow Tropical Marine Ecosystems”, (1989) 27 *Oceanogr. Mar. Biol. Annu. Rev.* 337.
- P. van Heijnsbergen, *International Legal Protection of Wild Fauna and Flora* (IOS Press) (1997).
- A. Hillary, M. Kokkonen and L. Max (eds), *World Heritage Papers No. 4 - Proceedings of the World Heritage Marine Biodiversity Workshop* (UNESCO) (2003).
- O. Hoegh-Guldberg, “Climate change, coral bleaching and the future of the world’s coral reefs” (1999) 50 *Marine Freshwater Research* 839.
- S. Idso and K. Idso, “CO₂ and Coral Calcification: Is the Tide of Pessimism About to Turn?” (2002) Editorial Comment v.5 (12) Center for the Study of Carbon Dioxide and Global Change (copy available at www.co2science.org).
- IUCN, *An Introduction to the African Convention on the Conservation of Nature and Natural Resources – IUCN Environmental Policy and Law Paper No. 56* (2004).
- M. Jeffery, “An International Regime for Protected Areas” in J. Scanlon and F. Burhenne-Guilmin, *International Environmental Governance – An International Legal Regime for Protected Areas* (2003) 1.
- S. Jennings and N. V. C. Polunin, “Impacts of Fishing on Tropical Reef Ecosystems” (1996) 25(1) *Ambio* 44.

- G. Jobbins, "Tourism and coral-reef-based conservation: can they coexist?" in I. Côté and J. Reynolds, *Coral Reef Conservation* (CUP) (2006) 237.
- S. Johnston, "Financial Aid, Biodiversity and International Law" in Bowman and Redgwell (eds), *International Law and the Conservation of Biological Diversity* (Kluwer) (1996) 271.
- T. Jones, "Wise Use of Coastal Wetlands: The Approach of the Ramsar Convention" (1998) 88 *Naturopa* 11.
- I. Kawaley, "Delimitation of Islands Fringed with Reefs: Article 6 of the 1982 Law of the Sea Convention" (1992) 41 *ICLQ* 152.
- R. Kay and J. Alder, *Coastal Planning and Management* (Spon Press) (2000).
- G. Kelleher, *Guidelines for Marine Protected Areas* (IUCN) (1995).
- G. Kelleher and C. Recchia, "Editorial – lessons from marine protected areas around the world" (1998) 8(2) *Parks* 1.
- M. King and U. Faasili, "A network of small, community owned village fish reserves in Samoa" (1998) 8(2) *Parks* 11.
- J. A. Kleypass *et al.*, "Geochemical Consequences of Increased Atmospheric Carbon Dioxide on Coral Reefs" (1999) 284 *Science* 118.
- V. Koester, "The Biodiversity Convention Negotiation Process and Some Comments on the Outcome" (1997) 27(3) *Environmental Policy & Law* 175.
- R. Lagoni, "Marine Protected Areas in the Exclusive Economic Zone" in A. Kirchner (ed.), *International Maritime Environmental Law – Institutions, Implementation and Innovations* (2003) (Kluwer) (2003) 157.

- C. Langdon, "Rise in Atmospheric CO₂ Threatens Coral Reefs... An experiment Carried out at Biosphere 2" (1998) available at www.earthmatters.com.
- P. le Prestre, "The CBD at Ten: The Long Road to Effectiveness" (2002) 5 *Journal of International Wildlife Law & Policy* 269.
- Y. Loya, "Recolonization of Red Sea Corals Affected by Natural Catastrophes and Man-Made Perturbations" (1976) 57 *Ecology* 278.
- S. Lyster, *International Wildlife Law* (CUP) (1985).
- V. T. Matthews, *The Ramsar Convention on Wetlands: Its History & Development* (Ramsar Convention Bureau) (1993).
- T. McClanahan, "Challenges and accomplishments towards sustainable reef fisheries" in I. Côté and J. Reynolds (eds), *Coral Reef Conservation* (CUP) (2006) 147
- F. McConnell, *The Biodiversity Convention – A Negotiating History* (Kluwer) (1996).
- Lord McNair, *The Law of Treaties* (Clarendon Press) (1961).
- V. Morell, "The Variety of Life" (1999) 195(2) *National Geographic* 6.
- K. Muller, *Underwater Indonesia: A Guide to the World's Greatest Diving* (PeriPlus Editions) (1995).
- P. Mumby and A. Harborne, "A seascape-level perspective of coral reef ecosystems" in I. Côté and J. Reynolds, *Coral Reef Conservation* (CUP) (2006) 78.
- L. Muscatine and E. Cernichiaro, "Assimilation of photosynthetic products of zooxanthellae by a reef coral" (1969) 137 *Biol. Bull.* 506.

- NOAA, *Oil Spills in Coral Reefs* (NOAA) (2001).
- M. H. Nordquist (ed.), *United Nations Convention on the Law of the Sea: A Commentary*, Volume IV (Martinus Nijhoff) (1991).
- J. W. Nybakken, *Marine Biology* (Benjamin Cummings) (2001, 5th Ed.).
- O. Okidi, "Protection of the Marine Environment Through Regional Arrangements" (1990) 23 *Law of the Sea Institute Proceedings* 474.
- D. Ong, "The Relationship Between Environmental Damage and Pollution: Marine Oil Pollution Laws in Malaysia and Singapore" in M. J. Bowman and A. Boyle (eds), *Environmental Damage in International and Comparative Law* (OUP) (2002) 191.
- P. Ottesen *et al*, "Shipping Threats and Protection of the Great Barrier Reef Marine Park – The Role of the Particularly Sensitive Sea Area Concept" (1994) 9(4) *International Journal of Marine & Coastal Law* 507.
- M. P. Pearson and A. I. Shehata, "Protectorates Management for Conservation and Development in the Arab Republic of Egypt" (1998) 8(2) *Parks* 29.
- D. Peck, *Coral Reefs & the Ramsar Convention* (1995) available at www.ramsar.org.
- W. Precht and R. Aronson, "Death and resurrection of Caribbean coral reefs" in I. Côté and J. Reynolds (eds), *Coral Reef Conservation* (CUP) (2006) 40.
- R. Primack, *Essentials of Conservation Biology* (Sinauer) (2002).
- A. Pullin, *Conservation Biology* (CUP) (2002).
- P. B. Rainey and M. Travisano, "Adaptive radiation in a heterogeneous environment" (1998) 394 *Nature* 69.

- C. Redgwell, "The Protection of the Antarctic Environment and the Ecosystem Approach" in Bowman and Redgwell (eds), *International Law and the Conservation of Biological Diversity* (Kluwer) (1996) 109.
- C. M. Roberts *et al*, "Effects of Marine Reserves on Adjacent Fisheries" (2001) 294 *Science* 1920.
- C. M. Roberts *et al.*, "Marine Biodiversity Hotspots and Conservation Priorities for Tropical Reefs" (2002) 29(5) *Science* 1280.
- R. V. Salm and J. R. Clark, *Marine and Coastal Protected Areas: A Guide for Planners and Managers* (IUCN) (2000).
- B. Salvat, J. Haapkylä and M. Schrimm, *Coral Reef Protected Areas in International Instruments* (CRIOBE-EPHE) (2002)
- P. H. Sand (ed.), *The Effectiveness of International Environmental Agreements* (Grotius) (1992)
- P. Sands, *Principles of International Environmental Law* (CUP) (2003, 2nd ed.).
- J. Scanlon and F. Burhenne-Guilmin, *International Environmental Governance – An International Legal Regime for Protected Areas* (2003) - paper prepared for Parks Canada in advance of the Vth IUCN World Parks Congress, Durban, South Africa.
- H. Schuhmacher, "Ability in Fungiid Corals to Overcome Sedimentation" (1977) *Proceedings, Third International Coral Reef Symposium* 503.
- T. Scovazzi, "Marine Specially Protected Areas Under International Law" in T. Scovazzi (ed.), *Marine Specially Protected Areas* (Kluwer) (1999) 17.
- M. N. Shaw, *International Law* (CUP) (1997).

- Secretariat of the Convention on Biological Diversity, *Sustaining Life on Earth* (CBD/UNEP) (2000).
- C. Shine, "Biological Diversity and the Ramsar Convention on Wetlands" (2001) 48 *Environmental Encounters* 49.
- I. Sinclair, *The Vienna Convention on the Law of Treaties* (Manchester University Press) (1984, 2nd Ed.).
- D. W. Souter and O. Linden, "The Health and Future of Coral Reef Systems" (2000) 43 *Ocean & Coastal Management* 657.
- F. Spadi, "Navigation in Marine Protected Areas: National and International Law" (2000) 31 *Ocean Development & International Law* 285.
- M. D. Spalding *et al.*, *World Atlas of Coral Reefs* (University of California) (2001).
- D. Stone, "Stemming the Loss of Biological Diversity: The Institutional and Ethical Contours" (1997) 6(3) *RECIEL* 231.
- D. Tarte and R. Lindsay, "Wetlands in the Coastal Zone and Peatlands - A Key Role for Ramsar" in *Themes for the Future – Special Intervention*, 3rd Plenary Session, 21 March 1996, Brisbane CCP.
- Ø. Thiem *et al.*, "Food supply mechanisms for cold-water coral along a continental shelf edge" (2006) 60 (3-4) *Journal of Marine Systems* 207.
- J. Thorsell, "From Strength to Strength: World Heritage in its 20th Year" in *World Heritage Twenty Years Later. IVth World Congress on National Parks and Protected Areas* (IUCN) (1992) 19.

- J. Thorsell, "Human Use of World Heritage Sites. A Global Overview" (1997) 7(2) *Parks* 3.
- S. M. Titchen, "Challenging the Spirit: A Brief History" (2001) 2 *World Conservation* 6.
- C. Tisdell and C. Wilson, "World Heritage Listing of Australian Natural Sites: Tourism Stimulus and its Economic Value" (2002) 32(2) *Economic Analysis & Policy* 27.
- K. Trenberth, "The Definition of El Niño" (1997) 78(12) *Bulletin of the American Meteorological Society* 2771.
- T. Treves, "Regional Approaches to the Protection of the Marine Environment", in Nordquist, Moore and Mahmoudi (eds), *The Stockholm Declaration and Law of the Marine Environment* (Kluwer Law International) (2003) 137.
- J. Turner *et al*, "Environmental impact assessment for coral reefs: advocating direct protective approaches" in I. Côté and J. Reynolds (eds), *Coral Reef Conservation* (CUP) (2006) 332.
- UNEP, *Action Plan for the Caribbean Environment Programme: Regional Seas Reports and Studies No. 26* (1983).
- UNEP/WWF, *Conventions and Coral Reefs* (2003).
- UNEP/WCMC, *In the front line: shoreline protection and other ecosystem services from mangroves and coral reefs* (UNEP-WCMC) (2006).

- R. Vernhes, "Implementation of the World Heritage Convention in South East Asia and the Pacific", in Workshop Papers from the 18th General Assembly of IUCN, *Critical Issues for Protected Areas Part 1: World Heritage Session* (1990) 23.
- A. Vincent, "Live food and non-food fisheries on coral reefs" in I. Côté and J. Reynolds (eds), *Coral Reef Conservation* (CUP) (2006) 183.
- C. Wabnitz *et al.*, *From Ocean to Aquarium: The Global Trade in Marine Ornamental Species* (UNEP-WCMC) (2003).
- M. Watson and R. F. G. Ormond, "Effect of an Artisanal Fishery on the Fish and Urchin Populations of a Kenyan Coral Reef" (1994) 109 *Marine Ecology Progress Series* 115.
- S. Wells, "Coral Reefs and the Ramsar Convention" (1984) 15(4-6) *IUCN Bulletin* 56.
- C. Wild *et al.*, "Coral mucus functions as an energy carrier and particle trap in the reef ecosystem" (2004) 428 *Nature* 66.
- C. Wilkinson, *Status of Coral Reefs of the World: 2000* (GCRMN) (2000).
- C. Wilkinson, *Status of Coral Reefs of the World – Executive Summary* (GCRMN) (2002).
- C. Wilkinson, "Status of coral reefs of the world: summary of threats and remedial action" in I. Côté and J. Reynolds (eds), *Coral Reef Conservation* (CUP) (2006) 3.

- E. Williams and L. Bunkley-Williams, "The world-wide coral reef bleaching cycle and related sources of coral mortality" (1990) 335 *Atoll Research Bulletin* 1.
- C. Wold, "The Futility, Utility and Future of the Biodiversity Convention" (1998) 9 *Col. JIEL&P* 1.
- C. Wold, "The Status of Sea Turtles under International Environmental Law and International Environmental Agreements" (2002) 5(1-2) *Journal of International Wildlife Law & Policy* 11
- R. Wolfrum, "The Convention on Biological Diversity: Using State Jurisdiction as a Means of Ensuring Compliance" in R. Wolfrum (ed), *Enforcing Environmental Standards: Economic Mechanisms as Viable Means?* (Springer) (1996) 373.
- World Tourism Organisation, "International Tourism Receipts" (2004) 2(2) *World tourism Barometer* 2.
- A. Yankov, "The Law of the Sea Convention and Agenda 21: Marine Environmental Implications" in A. Boyle and D. Freestone (eds), *International Law and Sustainable Development: Past Achievements and Future Challenges* (OUP) (1999) 271.