



*Ministero dell'Ambiente
e della Tutela del Territorio
e del Mare*

Maritime traffic effects on biodiversity in the Mediterranean Sea

Volume 2 - Legal mechanisms to address maritime
impacts on Mediterranean biodiversity

Edited by Nilüfer Oral and François Simard



IUCN Centre for Mediterranean Cooperation / Global Marine Programme



Maritime traffic effects on biodiversity in the Mediterranean Sea

Volume 2 - Legal mechanisms to address maritime
impacts on Mediterranean biodiversity

Edited by Nilüfer Oral and François Simard

The designation of geographical entities in this book, and the presentation of the material, do not imply the expression of any opinion whatsoever on the part of the Italian Ministry of Environment, Land and Sea, or IUCN concerning the legal status of any country, territory, or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

The views expressed in this publication do not necessarily reflect those of Italian Ministry of Environment, Land and Sea or IUCN.

This publication has been made possible by funding from the Italian Ministry of Environment, Land and Sea.

Published by: IUCN, Gland, Switzerland and Malaga, Spain.

Copyright: © 2008 International Union for Conservation of Nature and Natural Resources.

Reproduction of this publication for educational or other non-commercial purposes is authorized without prior written permission from the copyright holder provided the source is fully acknowledged.

Reproduction of this publication for resale or other commercial purposes is prohibited without prior written permission of the copyright holder.

Citation: Oral, Nilüfer and Simard, François (editors). 2008. *Legal mechanisms to address maritime impacts on Mediterranean biodiversity*. Malaga, Spain: IUCN Centre for Mediterranean Cooperation. 136 pp.

ISBN: 978-2-8317-1080-8

Legal deposit:

Design & layout by: ATEA (www.atea.es)

Copy-editing by: Christopher J. Tribe

Cover photo by: François Simard

Produced by: IUCN Centre for Mediterranean Cooperation

Publication Management: Chadi Abi Faraj

Printed by: Solprint, Mijas (Malaga), Spain

Available from: IUCN Centre for Mediterranean Cooperation
C/ Marie Curie 35
29590 Campanillas, Malaga, Spain
Tel: +34 952 028430 - Fax: +34 952 028145

www.iucn.org/publications

This book is printed on  paper

Table of contents

List of contributors	5
Introduction	6
Chapter 1 Marine biodiversity, environmental conservation and maritime traffic: An overview of opportunities under the law of the sea to improve marine environmental conservation affected by maritime traffic - Philomène A. Verlaan, J.D., Ph.D.	
Abbreviations and acronyms	10
1. Introduction	12
2. The 1982 United Nations Convention on the Law of the Sea (UNCLOS)	13
3. Relationship of UNCLOS to other relevant legally binding global and regional instruments	16
4. Review of IMO's conventions addressing marine biodiversity and environmental conservation affected by maritime traffic	18
5. Review of the Barcelona Convention and its Protocols relevant to marine biodiversity and environmental conservation affected by maritime traffic	22
6. Implementation, compliance and enforcement: UNCLOS and IMO Conventions on VSP with particular regard to marine biodiversity and environmental conservation affected by maritime traffic	26
7. Conclusions	39
8. References	40
9. Further reading	43
10. Conventions	45
Appendix A. Mediterranean coastal State Parties to UNCLOS and relevant IMO Conventions	47
Appendix B. Mediterranean coastal State Parties to the Barcelona Convention and Protocols	48
Chapter 2 A review of global experience with particularly sensitive sea areas (PSSAs) - Julian P. Roberts, Ph.D. & J. Siân H. Pullen, Ph.D.	
Abbreviations and acronyms	50
1. Executive Summary	52
2. Introduction	55
3. PSSA overview	57
4. Historical development of the PSSA concept	59
5. Designation process	61
6. International experience with the PSSA concept	65

7. Valuable lessons learned from state practice	78
8. The Mediterranean: a brief history of engagement on PSSAs	84
9. References	86
10. Official Documents	90
Appendix. Summary of ships' routeing measures adopted for environmental purposes since 1994	92

**Chapter 3 The application of international measures for the protection
of the marine environment from the impacts
of shipping - Julian P. Roberts, Ph.D.**

Abbreviations and acronyms	96
1. Introduction	97
2. Nature of the impacts of shipping	98
3. Legal basis for protection of the marine environment from damage by ships	100
4. Maritime jurisdiction under the law of the sea	101
5. Prevention of damage from shipping	105
6. Mitigation of environmental damage	112
7. References	116
8. IMO documents	119

**Chapter 4 Maritime traffic, marine biodiversity and the Green Paper
on a future Maritime Policy for the EU - Stamatis Sivitos**

1. Introduction	122
2. Maritime traffic, marine biodiversity and the EU	123
3. Green Paper on a future Maritime Policy for the EU	125
4. Conclusions	132
5. References	133

List of contributors

Nilüfer Oral

Istanbul Bilgi University
Kurtuluş Deresi Cad. No 47 34440 Istanbul, Turkey
Co-Chair of the Oceans, Coasts and Coral Reefs Specialists Group
of the IUCN Commission on Environmental Law
Email nilufer_oral@yahoo.com

J. Siân H. Pullen

Marine Science & Policy Consultant
Emsworth, U.K.
Email sianprior9@hotmail.com

Julian P. Roberts

IUCN Global Marine Programme
28 rue Mauverney, CH-1196 Gland, Switzerland
Email julian.roberts@omv.com

François Simard

IUCN Centre for Mediterranean Cooperation and IUCN Global Marine Programme
PTA, Marie Curie 35, 29590 Campanillas, Málaga, Spain
Email francois.simard@iucn.org

Stamatis Sivitos

European Bureau for Conservation and Development
Rue de la Science 10, 1000, Brussels, Belgium
Email ssivitos@gmail.com

Philomène A. Verlaan

School of Ocean and Earth Science and Technology, University of Hawaii
and IUCN Commission on Environmental Law
Email pverlaan@gmail.com

Introduction

The Mediterranean Sea is a vital maritime highway linking with the Atlantic through the Strait of Gibraltar, with the Black Sea through the Turkish Straits and with the Indian Ocean through the Suez Canal. Bordered by 22 countries it is a sea of multiple seas, each with its own unique marine biodiversity and risks. To examine the impact of shipping on marine biodiversity in the Mediterranean Sea, a workshop was convened in Istanbul on 22–24 September 2007 by the IUCN Centre for Mediterranean Cooperation, the IUCN Global Marine Programme, and the Oceans, Coasts and Coral Reefs Specialist Group of the IUCN Commission on Environmental Law, with the generous support of the Italian Government. The Istanbul workshop marked an important step in furthering the interdisciplinary dialogue essential for improving the governance of shipping activities in the Mediterranean Sea, particularly in areas currently beyond national jurisdiction. One of the important outcomes of the workshop was the preparation of four background papers outlining the legal framework and the measures available within this framework; these papers have now been collected together in this volume. We hope they will provide helpful reference material and guidance to policy makers, government officials, academics and other interested parties committed to furthering the sustainable use of the Mediterranean Sea.

The importance of international shipping is self-evident, with over 80 percent of international trade being transported by sea. As a result of the vital role of international shipping in international trade, the navigational rights of international shipping have traditionally been and continue to be rigorously defended by maritime interests and safeguarded by international law. Yet these rights are coming under increasing scrutiny with the progressive deterioration of the marine environment and the alarming loss of marine biodiversity. The challenge facing international law and policy makers is to devise a framework of governance that can accommodate both the navigational interests of shipping and the

protection of the marine environment and marine biodiversity.

The first step in devising such a framework of governance is to assess whether the existing international legal framework for shipping provides the requisite legal foundation for protection of the marine environment and marine biodiversity. This formidable task has been undertaken by P.A. Verlaan, who has prepared a comprehensive review of the existing international legal framework for shipping and protection of the marine environment and marine biodiversity. In her extensive analysis of international law Verlaan comes to the important conclusion that the 1982 United Nations Law of the Sea Convention established a clear international obligation for states, including flag states, to protect the marine environment. She furthermore explains in her chapter how in relation to shipping this international legal obligation to protect the marine environment has been further complemented and strengthened by the complex regime of international conventions adopted by the International Maritime Organization (IMO) and other regional conventions. Verlaan observes, however, that the principal problem lies in obtaining effective compliance with and enforcement of these instruments.

Nevertheless, the legal framework alone will not suffice to promote the protection of the marine environment and marine biodiversity without effective implementing measures. One of the important implementing measures developed by the IMO in recent years is the Particularly Sensitive Sea Area (PSSA) concept. It was forged specifically to protect the marine environment from shipping activities potentially harmful to the marine environment and marine biodiversity. The growing number of states submitting proposals for the designation of PSSAs in recent years has focused attention on the PSSA concept, including its potential legal implications, as in the case of Australia seeking compulsory pilotage in the Torres Strait. In their joint contribution, J.P. Roberts and J.S.H. Pullen provide a critical assessment of

existing PSSAs as implemented by IMO Member Governments. The authors also specifically examine the potential role of PSSAs in protecting marine biodiversity from shipping activities in the Mediterranean Sea. They conclude that in light of the increase in shipping in the Mediterranean Sea projected to take place over the next decade there is a growing need for certain areas of the Mediterranean Sea to be designated as PSSAs. The authors also offer valuable expert opinion as to how states might begin this designation process for suitable areas.

Complementing the chapter on PSSAs, J.P. Roberts in a separate contribution examines other international measures adopted by the IMO to protect the marine environment and marine biodiversity from the possible negative impacts of shipping activities.

At the regional level, the European Union (EU) is playing an increasingly active role in influencing the direction of legislation and policy on international shipping and the protection of the marine environment. In 2006 the European Commission adopted the Green Paper for a future Maritime Policy of the European Union. In the fourth chapter, S. Sivitos (European Bureau for Conservation and Development, EBCD) provides a detailed analysis of this document. He explains that the essence of the Green Paper is to initiate

an EU governance framework based on an holistic and integrated approach, including marine spatial planning, for the protection of marine biodiversity from activities including shipping. Moreover, as discussed by Sivitos, the Green Paper specifically foresees that the Mediterranean Regional Seas Programme (MAP) will play a key role.

It is expected that this document will be the first of a series of publications on shipping by the IUCN Commission on Environmental Law, and the Oceans, Coasts and Coral Reefs Specialist Group.

Nilüfer Oral

Istanbul Bilgi University,
Faculty of Law
IUCN Commission on Environmental
Law, and the Oceans, Coasts and Coral
Reefs Specialist Group

François Simard

IUCN Global Marine Programme
IUCN Centre for Mediterranean
Cooperation

Any opinions or views expressed in the following chapters are those of the authors and others cited therein as appropriate and do not imply any opinion or views whatsoever by or on the part of IUCN or IUCN-Med on the subjects addressed.

Chapter 1

Marine biodiversity, environmental conservation and maritime traffic: An overview of opportunities under the law of the sea to improve marine environmental conservation affected by maritime traffic

Philomène A. Verlaan, J.D., Ph.D.

Abbreviations and acronyms

AFS	Anti-fouling substances
BWM	Ballast water management
CBD	Convention on Biological Diversity
CMS	Convention on the Conservation of Migratory Species of Wild Animals
EC	European Community
EEZ	Exclusive Economic Zone
EU	European Union
FOC	Flag of convenience
FSI	Flag state implementation
GAIRS	Generally accepted international rules and standards
HNS	Hazardous and noxious substances
IACS	International Association of Classification Societies
IBC	International bulk chemical(s)
ICJ	International Court of Justice
IMDG	International maritime dangerous goods
IMO	International Maritime Organization
INTERTANKO	International Association of Independent Tanker Owners
ITF	International Transport Workers' Federation
ITLOS	International Tribunal for the Law of the Sea
IUCN-Med	IUCN Centre for Mediterranean Cooperation
LC	London Convention
LCP	London Convention Protocol
MARPOL	Convention for the Prevention of Pollution from Ships

MCPAs	Marine and coastal protected areas
MEDA	Mediterranean Economic Development Assistance
MOU	Memorandum of Understanding
NGO	Non-governmental organization
NMFT	No more favourable treatment
OECD	Organization for Economic Cooperation and Development
OJEC	Official Journal of the European Community
OPRC	Oil pollution preparedness, response and cooperation
P&I	Protection & indemnity
PSC	Port state control
PSSA	Particularly sensitive sea area
REMPEC	Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea
SAFEMED	Euro-Mediterranean Cooperation on Maritime Safety and Prevention of Pollution from Ships
SPA	Specially protected area
SPAMI	Specially protected area of Mediterranean importance
UK	United Kingdom
USA	United States of America
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNCLOS	United Nations Convention on the Law of the Sea
UNEP	United Nations Environment Programme
VSP	Vessel-source pollution

1. Introduction

The rapidly growing maritime traffic sector is known to cause many threats to marine biodiversity. The World Conservation Congress, convened in Bangkok by IUCN in November 2004, addressed environmental issues involving maritime traffic in several Resolutions. Of particular interest in the present context are the Resolutions on Maritime Traffic and the Mediterranean Sea, Protected Areas in the Mediterranean, High Seas Biodiversity, and Undersea Noise Pollution. The International Maritime Organization (IMO) is a specialized United Nations (UN) agency, based in London, United Kingdom and responsible for maritime traffic at the global level, whose mandate includes the elimination of shipping-related sources of pollution. IMO plays an important role in the practical and globally applicable implementation of the marine environmental protection and conservation provisions of the 1982 United Nations Convention on the Law of the Sea (UNCLOS) for the maritime traffic sector. UNCLOS is the single most powerful legally binding international instrument mandating marine environmental protection and conservation. It applies to all sources of marine pollution, including land-based sources, both within and outside areas of national jurisdiction.

This chapter examines opportunities in the context of the international law of the sea to improve

conservation of marine biodiversity and the marine environment, insofar as these are affected by commercial¹ maritime traffic. It presents an overview of the fundamental environmental obligations placed by UNCLOS on states generally and on commercial maritime traffic in particular; outlines the relationship of UNCLOS to other relevant legally binding global instruments, with particular emphasis on those operated by or under the auspices of IMO; briefly reviews the current state of their implementation, compliance and enforcement with regard to maritime traffic; and suggests options for IUCN to assist with their improvement. Particularly Sensitive Sea Areas (PSSAs) are addressed by Roberts and Pullen in the next chapter.

This contribution was designed to serve as part of a set of background documents to inform interdisciplinary discussion among a broad spectrum of stakeholders at a meeting on Marine Biodiversity, Environmental Conservation and Maritime Traffic in the Mediterranean. It therefore also includes an overview and analysis of the Barcelona Convention and Protocols as relevant to maritime traffic. Examples adduced and options suggested are specifically tailored to the Mediterranean. The main arguments, however, would be relevant to similar discussions on other shared seas or marine ecosystems.

1 This chapter does not address warships and other government ships operated for non-commercial purposes. 'Warship' is defined in UNCLOS Article 29.

2. The 1982 United Nations Convention on the Law of the Sea (UNCLOS)

2.1 Overview of fundamental marine environmental obligations for states under UNCLOS

The Preamble to UNCLOS states that the Parties intend to establish ‘a legal order for the seas and oceans which will facilitate international 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,’ bearing in mind ‘that the problems of ocean space are closely interrelated and need to be considered as a whole.’ Consequently, UNCLOS is not a traditional ‘framework treaty’ (see discussion of the ‘framework treaty’ concept in Boyle, 2005); it does not depend for its implementation on the development of annexes and protocols, and ‘its provisions form an integral whole.’

Detailed obligations on states with regard to the marine environment and living resources are found throughout UNCLOS. All of its Part XII is devoted to setting out rules for the preservation and protection of the marine environment. Part XII begins by stating the clear and wholly unqualified obligation of states ‘to protect and preserve the marine environment’ (Article 192). States do not yet sufficiently recognise the implications of the uncompromising and undiluted nature of this fundamental environmental requirement. Even less recognised is the increasing consensus among commentators that Article 192 is now customary international law (e.g. Freestone, 1996; Birnie & Boyle, 2002; Van Dyke, 2004); this may now also be the case for much of the rest of Part XII (e.g. Birnie & Boyle, 2002; Boyle, 2005). The significance of this status as customary international law is that a number of commentators consider that even non-parties to UNCLOS are thereby bound to comply with the relevant provisions (see *also* section 2.4, *below*).

Article 194 elaborates on Article 192, requiring states to:

- a) ‘take, individually or jointly as appropriate, all measures consistent with this Convention that are necessary to prevent, reduce and control pollution of the marine environment from any source, using for this purpose the best practicable means at their disposal and in accordance with their capabilities ...’ (Article 194(1)). Note that the obligation on states to *take* such measures is unqualified; the *nature* of the measures taken is subject to the two qualifications set out after the overarching obligation;
- b) ‘refrain from unjustifiable interference with activities carried out by other States in the exercise of their rights and in pursuance of their duties in conformity with [UNCLOS]’ (Article 194(4));
- c) ‘ensure that activities under their jurisdiction and control are so conducted as not to cause damage by pollution to other states and their environment’ (Article 194(2));
- d) ‘[ensure] that pollution arising from incidents or activities under their jurisdiction or control does not spread beyond the areas where they exercise sovereign rights in accordance with this Convention ...’ (Article 194(2));
- e) ‘deal with all sources of pollution of the marine environment ...’ (Article 194(3));
- f) ‘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)).

Note that the obligations on states to ‘ensure,’ ‘deal,’ and ‘protect and preserve’ set out in Article 194(2), (3) and (5) are unqualified.

Article 195 obliges states ‘not to transfer, directly or indirectly, damage or hazards from one area to another or transform one type of pollution into

another.’ States must prevent, reduce and control pollution of the marine environment resulting from the ... intentional or accidental introduction of species, alien or new, to a particular part of the marine environment, which may cause significant and harmful changes thereto’ (Article 196), and they must ‘jointly develop and promote contingency plans for responding to pollution incidents in the marine environment’ (Article 199).

States are ‘responsible for the fulfilment of their international obligations concerning the protection and preservation of the marine environment. They shall be liable in accordance with international law’ (Article 235(1)). Furthermore, ‘states must ensure that recourse is available in accordance with their legal systems for prompt and adequate compensation or other relief in respect of damage caused by pollution of the marine environment by natural or juridical persons under their jurisdiction’ (Article 235(2)). Finally, UNCLOS does not affect recourse to ‘civil proceedings in respect of any claim for loss or damage resulting from pollution of the marine environment’ (Article 229).

Even on the high seas, states are circumscribed in what they may do. The exercise of high-seas freedoms is subject to the ‘conditions laid down by this Convention’, which includes UNCLOS Part XII on the marine environment, and ‘other rules of international law’ (Article 87). These freedoms must be ‘exercised by all states with due regard for the interests of other states in their exercise of the freedom of the high seas’ (Article 87(2); see also section 6.1.2.1, *below*).

In their Exclusive Economic Zones (EEZ), coastal states must have due regard to the rights and duties of other states in exercising their own rights and performing their own duties under UNCLOS (Article 56(2)). The concomitant obligations for the other states in terms of their rights and duties vis-à-vis those of coastal states are established, and those other states must ‘comply with the laws and regulations adopted by the coastal state in accordance with [UNCLOS] ... and other rules of international law ...’ (Article 58(3); see also section 6.1.2.1, *below*).

The ‘due regard’ obligation was interpreted by the International Court of Justice (ICJ) to require cooperation between states for conservation of living resources even on the high seas, when ‘the needs of conservation for the benefit of all’ are involved, replacing the former ‘laissez-faire treatment of the living resources of the sea in the high seas.’² The parties were also required ‘to take full account ... of any fishery conservation measures the necessity of which is shown to exist in those waters.’³

A ship engaging in ‘innocent passage’ through the territorial sea of another state must do so ‘in conformity with [UNCLOS] ... and with other rules of international law’ (Article 19(1)); with regard specifically to the marine environment, passage is not innocent if the ship ‘engages in ... any act of wilful and serious pollution contrary to [UNCLOS]’ (Article 19(2)(h); see also section 6.1.2.1, *below*).

The UNCLOS Articles relating to compliance with and enforcement of the marine environmental rules are addressed in section 6, *below*.

2.2 Definition of pollution and dumping

The definition of pollution in UNCLOS is precautionary and comprehensive: ‘the introduction by man, directly or indirectly, of substances or energy into the marine environment, including estuaries, which results or is likely to result in such deleterious effects as harm to living resources and marine life, hazards to human health, hindrance to marine activities, including fishing and other legitimate uses of the sea, impairment of quality for use of sea water and reduction of amenities’ (Article 1(4)). Dumping is ‘any deliberate disposal at sea of wastes or other matter from vessels, aircraft, platforms or other man-made structures’ and of ‘vessels, aircraft, platforms or other man-made structures’ themselves (Article 1(5)).

2.3 Environmental obligations for maritime traffic

With regard to environmental effects of maritime traffic (hereinafter referred to as vessel-source

2 *Fisheries Jurisdiction Case (United Kingdom v. Iceland)*, Decision of 25 July 1974, ICJ, para. 72.

3 *Ibid.*

pollution (VSP) and including dumping at sea unless specifically distinguished), Articles 210 and 211 place the unqualified obligation on states to adopt laws and regulations to prevent, reduce and control pollution of the marine environment by dumping and from vessels, respectively. For dumping, 'states, acting especially through competent international organizations or diplomatic conference, shall endeavour to establish global and regional rules, standards and recommended practices and procedures to prevent, reduce and control such pollution' (Article 210). For pollution from vessels, the obligations are even stronger: 'states, acting especially through competent international organizations or diplomatic conference, shall establish international rules and standards' to prevent, reduce and control such pollution. In both cases, these international rules, once adopted, are *minimum* standards (Article 211).

National rules, *regardless of individual national capacities or other national considerations*, must be established and they must be at least as effective as the global rules. Although not referred to as such in UNCLOS,⁴ for VSP, the competent international organization is IMO.

2.4 Applicability of UNCLOS to states generally and Mediterranean states in particular

UNCLOS is wholly applicable to its 156 (as of 11 July 2008, *see also* footnote 6, *below*) states parties. Those parts of UNCLOS that reflect or have become customary international law may apply to non-parties. (With regard to the customary international law status of Part XII and its implications for the applicability of UNCLOS to non-parties, *see* section 2.1, *above*). Signatories that have not yet ratified UNCLOS are obliged under international law not to take any actions that would defeat the object and purpose of UNCLOS.⁵

Of the Mediterranean coastal states, Libya is a signatory non-party to UNCLOS;⁶ Israel, Syria and Turkey are non-signatory non-parties. Appendix A sets out the current (as of 11 July 2008, *see also* footnote 6, *above*) status of UNCLOS membership for Mediterranean coastal states. All Member States of the European Union (EU) and the EU itself are parties. Outside the Mediterranean region, the United States (USA) is an important non-signatory non-party to UNCLOS. Non-signatory non-parties may join UNCLOS by accession.

4 IMO is referred to in Annex VIII, Article 2, in the context of special arbitration and lists of experts.

5 A signatory state 'is obliged to refrain from acts which would defeat the object and purpose of a treaty ...' (Article 18, Vienna Convention on the Law of Treaties, 1969).

6 This status summary is based on information stated as being correct on 11.07.2008 on the UNDOALOS website; last accessed on 20.07.2008.

3. Relationship of UNCLOS to other relevant legally binding global and regional instruments

3.1 Global instruments

3.1.1 General

UNCLOS is not intended to be static or to operate in isolation: it envisages its own evolution and development in a dynamic international context, as long as its fundamental objectives and purposes are not thereby undermined. This is evident from its stated relationship to general international law (which, pursuant to the Preamble, continues to govern ‘matters not regulated by [UNCLOS]’ and is also invoked elsewhere in UNCLOS), and to other global and regional treaties (which UNCLOS also refers to), and through the incorporation in UNCLOS by reference of other generally accepted international agreements, rules and standards (these are referred to in, for example, UNCLOS Articles 207–214 and 217–220).

The obligations set out in Part XII ‘are without prejudice to the specific obligations assumed by states under special conventions and agreements concluded previously which relate to protection and preservation of the marine environment and to agreements which may be included in furtherance of the general principles set forth in this Convention’ (Article 237). It continues: ‘specific obligations assumed by states under special conventions, with respect to protection and preservation of the marine environment, should be carried out in a manner consistent with the general principles and objectives of this Convention.’

Article 311 provides, *inter alia*, that UNCLOS ‘shall not alter the rights and obligations of states parties which arise from other agreements compatible with this Convention and which do not affect the enjoyment by other states parties of their rights or the performance of their obligations under this Convention’, and this article ‘does not affect international agreements expressly permitted or preserved by other articles of this Convention.’

In general, UNCLOS prevails over other conventions related to the marine environment

where the latter, even if concluded afterwards (see, e.g. Article 311(3)), are inconsistent or incompatible with UNCLOS.

3.1.2 Global environmental instruments specifically addressing maritime traffic

Articles 237 and 311 and those in Part XII and elsewhere in UNCLOS addressing the marine environment apply to the global conventions addressing environmental effects of VSP. Promulgated and managed under the auspices of IMO, they are reviewed in section 4, *below*.

3.1.3 Other relevant global environmental instruments

With regard to the requirement in UNCLOS to protect and preserve rare and fragile ecosystems and the habitat of depleted, threatened or endangered species and other forms of marine life from VSP, the principal other relevant global conventions include Ramsar (wetlands), Bonn/CMS (migratory species), World Heritage (cultural and natural heritage), and Biological Diversity (CBD). The relationship between UNCLOS and CBD is perhaps the most complex and discussion of its intricacies is beyond the scope of this paper (see, e.g. Boyle, 2005). For maritime traffic and VSP, UNCLOS and CBD are complementary. CBD requires ‘Contracting Parties [to] ... implement [it] ... with respect to the marine environment consistently with the rights and obligations of states under the law of the sea’ and its provisions ‘shall not affect the rights and obligations of any Contracting Party deriving from any existing international agreement, except where the exercise of those rights and obligations would cause a serious damage or threat to biological diversity’ (Article 22).

Overall, UNCLOS complements and may strengthen these other conventions. For VSP, their implementation is especially helpful in determining criteria and assessing applications for the designation of ‘Special Areas’ and PSSAs under

the auspices of IMO, and their relationship with 'Marine and Coastal Protected Areas' (MCPAs) and 'Specially Protected Areas' (SPAs), which all contribute to implementing UNCLOS Article 211(6). These different areas and the related conventions are examined in detail in the following chapter and are not further discussed herein. With regard to VSP, UNCLOS is supportive of and may operate to strengthen CBD's provisions on the introduction of alien species. Also important in achieving the objectives of UNCLOS with regard to prevention, control and reduction of VSP is the Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (Basel Convention). All the Mediterranean coastal states are parties to CBD and the Basel Convention.

3.2 Regional instruments

Article 197 of UNCLOS requires 'states [to] cooperate on a global basis, and, as appropriate, on a regional basis, directly or through competent international organizations, 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.' This supports the general obligation in Article 194 on states to 'endeavour to harmonize their policies' to prevent, reduce and control pollution of the marine environment.

The ICJ has held that obligations to cooperate set out in legally binding instruments require 'meaningful negotiations' by states and to be 'a special application of a principle which underlies all international relations, and which is moreover recognized in Article 33 of the Charter of the United Nations as one of the methods for the

peaceful settlement of international disputes.'⁷ The International Tribunal for the Law of the Sea (ITLOS) has held that 'the duty to cooperate is a fundamental principle in the prevention of pollution of the marine environment under Part XII of [UNCLOS] ... and general international law.'⁸

The relevant legally binding regional marine environmental instrument for the Mediterranean is the Convention for the Protection of the Marine Environment and the Coastal Regions of the Mediterranean, 1995 ('Barcelona Convention'), together with its protocols, which are reviewed in section 5, *below*. This chapter does not address the law deriving from the treaties governing the EU.

It is generally agreed that the Mediterranean is an 'enclosed or semi-enclosed sea' as defined in UNCLOS Article 122 (see e.g. Scovazzi, 1996, 2002). Bordering states 'should cooperate with each other in the exercise of their rights and the performance of their duties under [UNCLOS] To this end they shall endeavour, directly or through an appropriate regional organization, to coordinate the management, conservation, exploration and exploitation of the living resources of the sea ... [and] the implementation of their rights and duties with respect to the protection and preservation of the marine environment ...'(Article 123). The absence of mandatory language for cooperation between bordering states of such a sea in terms of rights and duties is somewhat mitigated by the requirement that bordering states endeavour to coordinate their actions in terms of living resources and the marine environment. Article 123, although weak, remains subject to and is strengthened by the obligations to cooperate set out in Articles 197 and 194.

7 *North Sea Continental Shelf Cases* (Federal Republic of Germany/Denmark; Federal Republic of Germany/Netherlands), ICJ Decision of 20 February 1969, para. 86.

8 *MOX Plant Case* (Ireland vs. United Kingdom), ITLOS Order of 3 December 2001, para. 82.

4. Review of IMO's conventions addressing marine biodiversity and environmental conservation affected by maritime traffic

4.1 Overview

Six global agreements specifically directed at VSP implement and further elaborate on the environmental provisions of UNCLOS. Hereinafter referred to as IMO's Environmental Conventions, they are briefly summarized below.⁹ Appendix A shows membership of IMO's Environmental Conventions and their protocols and annexes by the Mediterranean coastal states, stated as being correct on the IMO website as of 30 June 2008 (last accessed 20 July 2008). Not addressed in this chapter are the liability conventions.

4.2 IMO's Environmental Conventions

4.2.1 International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL)

MARPOL and its six Annexes cover six categories of wastes from normal operations of or accidental discharges from ships, i.e. oil, chemicals, goods in packaged form, sewage, garbage and air pollution. The Annexes are frequently updated. MARPOL parties must accept Annexes I and II, but the other Annexes are voluntary. A very brief review¹⁰ of the Annexes follows.

4.2.1.1 MARPOL Annex I—Oil

Operational discharges of oil from tankers are allowed only when a number of conditions are met. No discharge of any oil whatsoever must be made from the cargo spaces of a tanker within 50 miles of the nearest land. Parties must ensure the provision of adequate reception facilities for the

reception of oily wastes in their ports. A feature of MARPOL is the concept of 'Special Areas' in which, for reasons relating to their 'oceanographical and ecological condition' (such as low water exchange caused by the configuration of the sea concerned) and heavy maritime traffic, special mandatory methods for marine pollution prevention are required. Oil discharges within these Special Areas are completely prohibited, with minor and well defined exceptions. The Mediterranean Sea is one of these Special Areas under this Annex.

4.2.1.2 MARPOL Annex II—Chemicals (noxious liquid substances)

It sets out discharge criteria and measures for the control of pollution by chemicals carried in bulk, in packaged form and on chemical tankers. Chemical tankers built after 1 July 1986 must comply with the International Bulk Chemical Code.¹¹ This sets international standards for the safe transport by sea in bulk of liquid dangerous chemicals, by, *inter alia*, prescribing the design and construction standards of ships involved in such transport and the equipment they must carry so as to minimize the risks to the ship, her crew and the environment, given the hazards (e.g. flammability, toxicity, corrosivity and reactivity) of the products covered by the Code. The IBC Code lists some 250 chemicals and their hazards and specifies the ship type required to carry a given chemical and its environmental hazard rating. Discharge of residues is allowed only into reception facilities unless certain conditions (which vary with the category of the substances involved) are complied with. No discharge of residues containing noxious substances is permitted within 12 nautical miles of the nearest land.

9 These summaries are derived from detailed descriptions posted on the IMO website, <http://www.imo.org>. IMO refers to these Conventions on its website as 'Prevention of Marine Pollution Conventions.'

10 Because of space restrictions in the present document, for additional details on MARPOL operational discharge standards, e.g. for oil and garbage generally and in special areas specifically, and the possibility for special SO_x Emission Control Areas under Annex VI, the reader is referred to the MARPOL Convention and its Annexes, available online at http://www.imo.org/Conventions/contents.asp?doc_id=678&topic_id=258

11 IBC Code, http://www.imo.org/Environment/mainframe.asp?topic_id=1174

4.2.1.3 MARPOL Annex III—Packaged goods

It sets out requirements for issuing detailed standards on packing, marking, labelling, documentation, stowage, quantity limitations, exceptions and notifications for preventing pollution by harmful substances. Marine pollutants are specifically identified so that they can be packed and stowed on board ship in such a way as to minimize accidental pollution and to assist in their recovery by using clear marks to distinguish them from other (less harmful) cargoes. ‘Jettisoning of harmful substances carried in packaged form [is] prohibited, except where necessary [to] secure the safety of the ship or saving life at sea.’ Furthermore, ‘appropriate measures based on the physical, chemical and biological properties of harmful substances shall be taken to regulate the washing of leakages overboard, provided that compliance with such measures would not impair the safety of the ship and persons on board.’ Parties must issue instructions at the national level. The Annex refers to IMO’s uniform International Maritime Dangerous Goods (IMDG) Code, which covers packing, container traffic, stowage, and segregation of incompatible substances, among other topics. The IMDG Code includes products considered to be marine pollutants. It is regularly updated to accommodate new dangerous goods and to supplement or revise existing provisions.

4.2.1.4 MARPOL Annex IV—Sewage

It sets out regulations for discharge of sewage into the sea, ships’ equipment, systems to control sewage discharge, provision of sewage reception facilities at ports and terminals, and survey and certification requirements. It establishes a model International Sewage Pollution Prevention Certificate to be issued by national shipping administrations to ships under their jurisdiction. Ships may not discharge sewage within 12 nautical miles of the nearest land unless they have in operation an approved treatment plant, and they may only discharge such treated (i.e. comminuted and disinfected) sewage using an approved system at a distance of more than three

nautical miles from the nearest land. Untreated sewage may be discharged more than 12 nautical miles from the nearest land. Parties must ensure the provision of adequate sewage reception facilities at ports and terminals.

4.2.1.5 MARPOL Annex V—Garbage

This regulates disposal of different types of garbage. Disposal of plastics is completely prohibited. The requirements for disposal of other (non-plastic) garbage are much stricter in ‘Special Areas’. Parties must ensure the provision of garbage reception facilities at ports and terminals. The Mediterranean has been designated a Special Area under Annex V, but the Special Area requirements have not yet taken effect because of the lack of adequate reception facilities and lack of ratification by coastal states concerned.

4.2.1.6 MARPOL Annex VI—Air pollution

This sets limits on sulphur oxide and nitrogen oxide emissions from ship exhausts and prohibits deliberate emissions of ozone-depleting substances.

4.2.2 Convention for the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972 (London Convention or LC) and its 1996 Protocol (LCP)

LCP will supersede (replace) LC ‘as between Contracting Parties to this Protocol which are also Parties to the Convention.’ Both instruments will be in force in parallel for some time, but the momentum will gradually shift to LCP as more and more parties ratify it. LCP prohibits dumping, except for materials on an approved list. This is an environmental improvement over LC, which permits dumping of wastes at sea, except for materials on a banned list. The ‘precautionary approach’ is a general obligation under LCP, which also governs storage of wastes in the seabed, as well as abandonment, or toppling, of offshore installations.¹² The Basel Convention is relevant in this context through its ban on export of wastes for dumping.

¹² Strictly speaking, LC is not an IMO Convention in that it was not originally promulgated under IMO auspices. LC Article 24(2) refers to ‘a competent organization’ and in the 1970s the LC parties asked and IMO agreed to take on that role. LCP identifies IMO as the organization to provide the Secretariat for the Protocol.

4.2.3 International Convention on Oil Pollution Preparedness, Response and Cooperation, 1990 (OPRC)

OPRC provides a global framework for international cooperation and mutual assistance in preparing for and responding to a major oil pollution incident or threat and encourages states to develop and maintain an adequate capability to deal with oil pollution emergencies. Ships must carry a shipboard oil pollution emergency plan developed by IMO. Operators of offshore units under the jurisdiction of parties must also have oil pollution emergency plans or similar arrangements. These must be coordinated with national systems for responding promptly and effectively to oil pollution incidents. Ships must report incidents of pollution to coastal authorities and OPRC sets out the actions to be taken. It calls for the establishment of stockpiles of oil-spill combating equipment, holding of oil-spill combating exercises and development of detailed plans to handle pollution incidents. Parties must provide assistance to others in a pollution emergency and expenses incurred will be reimbursed.

OPRC's Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances, 2000 (HNS Protocol) follows the principles of OPRC for hazardous and noxious substances other than oil. The HNS Protocol entered into force on 14 June 2007.

4.2.4 Convention relating to Intervention on the High Seas in Cases of Oil Pollution Casualties, 1969 and its 1973 Protocol covering Substances Other Than Oil (Intervention Convention).

The Intervention Convention provides for the right of a coastal state to take measures on the high seas to prevent, mitigate or eliminate danger to its coastline or related interests from pollution by oil or substances other than oil or the threat thereof, following upon a maritime casualty. The coastal state is empowered to take only such action as is necessary, after due consultation with appropriate interests, including, in particular, the flag state(s) of the ship(s) involved, the owner(s) of the ship(s) or cargo(es) in question and, where circumstances permit, independent experts appointed for this purpose.

The Intervention Convention is particularly interesting for the Mediterranean region, which has a large high seas area. The thrust of this Convention is echoed in UNCLOS Article 221, which also defines 'maritime casualty', and the two Conventions are considered to regulate the right of intervention by the coastal state in these circumstances both in the EEZ and on the high seas. However, 'to IMO's knowledge, the treaty has never been applied. There have been interventions beyond the territorial sea where states have followed some of its regulations regarding consultations. But IMO has never been involved in the way explicitly prescribed in the treaty' (Blanco-Bazán, 2003).

4.2.5 International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004 (BWM)

BWM is designed to prevent the potentially devastating effects of the spread of harmful aquatic organisms carried by ships' ballast water. All ships must implement a Ballast Water and Sediments Management Plan, carry a Ballast Water Record Book and carry out ballast water management procedures to a given standard. Parties may take additional measures which are subject to criteria set out in the Convention and to IMO guidelines. BWM refers to eleven sets of guidelines. Although BWM is not yet in force, six sets of guidelines have already been adopted and the rest are being developed. Ratification of this Convention is important for Mediterranean states.

4.2.6 International Convention on the Control of Harmful Anti-fouling Systems on Ships, 2001 (AFS)

AFS prohibits the use of harmful organotins in anti-fouling paints for ships and establishes a mechanism to prevent the potential future use of other harmful substances in anti-fouling systems. Parties must prohibit and/or restrict the use of harmful anti-fouling systems on ships flying their flag, on ships not entitled to fly their flag but which operate under their authority, and on all ships that enter a port, shipyard or offshore terminal of a party. AFS is due to enter into force on 17 September 2008. Ratification of this Convention is important for Mediterranean states.

4.3 Relationship of IMO's Environmental Conventions to UNCLOS

With regard specifically to VSP, UNCLOS operates to strengthen global, legally binding environmental instruments addressing VSP. This result arises from a combination of the following elements in UNCLOS (for a detailed discussion, see Oxman, 1991; ILA, 2000):

- a) the clear and wholly unqualified obligation of UNCLOS parties under Article 192 to protect and preserve the marine environment;
- b) the unqualified obligation under Article 194(1) to take 'all measures consistent with ... [UNCLOS] ... that are necessary to prevent, reduce and control pollution of the marine environment from any source, using for this purpose the best practicable means at their disposal and in accordance with their capabilities ...' and under Article 194(3) to ensure that the measures taken 'deal with all sources of pollution of the marine environment';
- c) the incorporation by reference into the obligations of UNCLOS of more detailed global (dumping) or international (VSP) rules and standards (hereinafter referred to as GAIRS for generally accepted international rules and standards) established by *a* (dumping) or *the* (VSP) 'competent international organization' or

'diplomatic conference' (Articles 210 and 211, respectively);

- d) the requirement that national laws and regulations 'shall be no less effective than' (Article 210, dumping) or 'shall at least have the same effect as that of' (Article 211, VSP) such GAIRS.

As already discussed in section 2, *above*, and as will be seen further in section 5, *below*, 'with considerable detail, [UNCLOS] sets forth the obligations of states to work with ... (competent international) organization(s) and to respect the results of that work. To an extraordinary degree, the duty to cooperate in and respect the work of these international organizations is anything but hortatory... As the "competent international organization" with respect to navigation safety, pollution from ships and other matters, IMO is in effect accorded extraordinary competence under [UNCLOS]' (Oxman, 1995).

4.4 Applicability of IMO's Environmental Conventions to UNCLOS parties who are not parties to IMO's Environmental Conventions

UNCLOS further strengthens the operation of the VSP Conventions by making the GAIRS they establish applicable to states that are not party to them, but are party to UNCLOS, by virtue of the elements set out in Section 4.3 *above*. As discussed in section 6 *below*, the enforcement and compliance provisions of UNCLOS also contribute to reinforcing the VSP Conventions.

5. Review of the Barcelona Convention and its Protocols relevant to marine biodiversity and environmental conservation affected by maritime traffic

5.1 Overview of the Barcelona Convention

The Convention for the Protection of the Marine Environment and the Coastal Regions of the Mediterranean, 1995 (the Barcelona Convention) obliges its parties in Article 4(1) to 'take all appropriate measures in accordance with [its] provisions and those Protocols in force to which they are party to prevent, abate, combat and to the fullest possible extent eliminate pollution of the Mediterranean Sea Area and to protect and enhance the marine environment in that Area so as to contribute towards its sustainable development.' Article 1 defines the Mediterranean Sea Area as its 'maritime waters ... including its gulfs and seas,' which therefore comprises all its various jurisdictional zones from internal waters to high seas. The precautionary and polluter-pays principles are to be applied (Article 4(3)) and protocols to implement the Convention must be formulated and adopted (Article 4(5)). Article 14 requires parties to adopt implementing legislation at national level. Article 29 provides that any Protocol is only binding on parties to that Protocol.

5.2 The Barcelona Convention and maritime traffic

With regard to shipping, Article 6 requires parties 'to take all measures in conformity with international law to prevent, abate, combat and to the fullest possible extent eliminate pollution of the Mediterranean Sea Area caused by discharges from ships and to ensure the effective

implementation in that Area of the rules which are generally recognized at the international level relating to the control of this type of pollution.' Parties must also take all appropriate measures to prevent, abate, combat and to the fullest possible extent eliminate pollution of the Mediterranean Sea Area caused by dumping from ships and aircraft or incineration at sea (Article 5), exploration and exploitation of the continental shelf, the seabed and its subsoil (Article 7), and land-based sources (Article 8). Article 9 mandates cooperation in pollution emergencies, whatever the causes. Articles 10 and 11, respectively, address parties' obligations with regard to conservation of biological diversity and transboundary movements of hazardous wastes.

5.3 The Barcelona Convention Protocols and maritime traffic

Of the Barcelona Convention's seven Protocols¹³, most relevant in the context of maritime traffic are VSP & Emergency, Dumping, SPA & Biodiversity, Hazardous Wastes, Shelf and (in preparation at the time of writing) ICZM. Appendix B shows the status of the original, amended and/or new versions of the Convention and the relevant Protocols adopted at the time of writing. The Land-Based Sources Protocol, although very important, is not directly relevant to maritime traffic and is not further addressed here. The Hazardous Wastes Protocol excludes from its scope wastes deriving from normal operations of ships the discharge of which is covered by another international instrument (i.e. MARPOL, and, arguably, the VSP & Emergency Protocol)

13 Protocol for the Prevention and Elimination of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft or Incineration at Sea (Dumping); Protocol Concerning Cooperation in Preventing Pollution from Ships and, in Cases of Emergency, Combating Pollution of the Mediterranean Sea (VSP & Emergency); Protocol for the Protection of the Mediterranean Sea Against Pollution from Land-based Sources and Activities; Protocol Concerning Specially Protected Areas and Biodiversity in the Mediterranean (SPA & Biodiversity); Protocol for the Protection of the Mediterranean Sea Against Pollution Resulting from Exploration and Exploitation of the Continental Shelf and the Seabed and its Subsoil (Shelf); Protocol on the Prevention of Pollution of the Mediterranean Sea by Transboundary Movements of Hazardous Wastes and Their Disposal (Hazardous Wastes); Protocol on Integrated Coastal Zone Management in the Mediterranean (ICZM). The ICZM Protocol was adopted in January 2008, after the time of writing. It is not yet in force. For a detailed review of the Barcelona Convention and its first six Protocols, the reader is referred to Scovazzi, 1996 and 2002.

(Article 3(2)). This Protocol valuably expands—for the Mediterranean—upon the Basel Convention in its coverage (for instance, radioactive wastes are included in Annex I(A)) and in addressing coastal state rights with regard to a foreign ship carrying hazardous wastes transiting through that coastal state’s territorial sea (Article 6(4)).

The remainder of this section briefly reviews the VSP & Emergency Protocol and those aspects of the SPA & Biodiversity Protocol specifically related to maritime traffic.

5.3.1 The VSP & Emergency Protocol

The parties must ‘cooperate to implement international regulations to prevent, reduce and control pollution of the marine environment from ships and to take all necessary measures in cases of pollution incidents’ (Article 3(1)). Not reviewed here are the extensive provisions setting out parties’ obligations regarding pollution incidents (emergencies). International regulations are those ‘aimed at preventing, reducing and controlling pollution of the marine environment from ships as adopted, at the global level and in conformity with international law, under the aegis of United Nations specialized agencies and in particular of the [IMO]’ (Article 1(e)). In addition to the marine environment *per se*, a number of ‘related interests’ of a coastal state may be threatened by VSP and the non-exhaustive list of such interests specifically includes ‘conservation of biological diversity and sustainable use of marine and coastal biological resources’ (Article 1(d)(v)).

The Protocol must be applied ‘without prejudice to the sovereignty or the jurisdiction of other parties or other states’ and ‘any measures taken by a party to apply [the] protocol shall be in accordance with international law’ (Article 3(3)). Article 4(2) requires parties to take measures in conformity with international law to prevent pollution of the Mediterranean Sea Area from ships in order to ensure effective implementation in that Sea Area of the relevant international Conventions and their applicable national legislation in their capacity as flag state, port state and coastal state.

Article 14 invokes the relevant obligations of MARPOL and requires parties to ensure that appropriate waste reception facilities are available in their ports and terminals for ships

and pleasure craft. In conformity with GAIRS and IMO’s global conventions, parties must assess the environmental risks of recognised routes used in maritime traffic and take appropriate measures to reduce risks of accidents or their environmental consequences (Article 15). Parties may facilitate all or part of the implementation of this Protocol by concluding appropriate bilateral or multilateral regional or subregional agreements (Article 17).

The Protocol endeavours to involve non-party states. Parties must, where appropriate, invite states that are not parties to this Protocol and international organizations to cooperate in its implementation (Article 21). Article 9(2) requires parties ‘to [ensure] that every ship sailing in its territorial waters’, including one flying a non-party flag, reports to the nearest coastal state (even if that coastal state is a non-party) and to the party itself ‘all incidents which result or may result in a discharge of oil or HNS’ as well as ‘the presence, characteristics and extent of spillages of oil or HNS, including HNS in packaged form, observed at sea, which pose or are likely to pose a threat to the marine environment or to the coast or related interests of one or more of the parties.’ These reports must follow ‘procedures ... required by, and in accordance with, the applicable provisions of the relevant international agreements’ (Article 9(1)). Note that ‘at sea’ is not defined and therefore is not limited to observations only in the territorial sea of the party concerned.

Article 11(2) requires parties ‘to [ensure] that every ship sailing in its territorial waters’, even one flying a non-party flag, in case of a pollution incident, follows the procedures described in the shipboard pollution emergency plan, provides the proper authorities with such detailed information about the ship and its cargo as is relevant to actions taken under Article 9, and cooperates with these authorities.

5.3.2 Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea

IMO, in cooperation with the United Nations Environment Programme (UNEP), established the Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (REMPEC) in Malta to coordinate anti-pollution activities in the Mediterranean and to assist Mediterranean coastal states in implementing the VSP & Emergency

Protocol. REMPEC was the first such Regional Centre in the world. Operating on the basis of the decisions of the Contracting Parties to the Barcelona Convention, REMPEC is administered by IMO and financed by the Mediterranean Trust Fund. Its programme of activities and budget are discussed every two years at Meetings of REMPEC Focal Points and subsequently submitted for approval and adoption to Meetings of the Contracting Parties.

5.3.3 The SPA & Biodiversity Protocol

Although not specifically singled out as such, maritime traffic is included in ‘activities’ under Article 3(5): ‘the parties shall monitor the components of biological diversity ... and shall identify processes and categories of activities which have or are likely to have a significant adverse impact on the conservation and sustainable use of biological diversity, and monitor their effects.’

Article 6 links implementation of this Protocol to the network of regional and international environmental instruments by requiring parties to take the protection measures required for each SPA, in particular by ‘strengthening the application of the other Protocols and other relevant treaties to which they are parties,’ by prohibiting dumping, by regulating the introduction of alien species and the passage, stopping or anchoring of ships, and by adding several broad sub-articles to catch any other activities or acts that may otherwise affect the achievement of the objectives of the Protocol and to permit the relevant corrective measures. These requirements are reinforced in Annex I(D) (5) to the Protocol.

The Protocol provides for the designation of Specially Protected Areas of Mediterranean Importance (SPAMIs), which may be established throughout the Mediterranean, including in ‘zones partly or wholly on the high seas’ (Article 9(1)(b)). Parties must endeavour to consult with ‘range states’ that are not party to the Protocol with a view to coordinating efforts to manage and protect endangered or threatened species (Article 11(7)). Parties must ‘regulate the accidental or intentional introduction of non-indigenous or genetically modified species to the wild and prohibit those that may have harmful impacts’ in the Mediterranean (Article 13). Parties must

‘invite’ non-parties and international organizations ‘to cooperate in implementing the Protocol’ and ‘parties undertake to adopt appropriate measures, consistent with international law, to ensure that no one engages in any activity contrary to the principles and purposes of the Protocol’ (Article 28). One commentator (Scovazzi, 2002) suggests that ‘no one’ might be interpreted to include non-parties, as they are not excluded.

In recognition of the complex geography of the Mediterranean Sea Area, Article 1(2) provides that ‘nothing in this Protocol nor any act adopted on the basis of this Protocol shall prejudice the rights, the present and future claims or legal views of any state relating to the law of the sea, in particular, the nature and extent of marine areas, the delimitation of marine areas between states with opposite or adjacent coasts, freedom of navigation on the high seas, the right and modalities of passage through straits used for international navigation and the right of innocent passage in territorial seas, as well as the nature and extent of jurisdiction of the coastal state, the flag state and the port state.’ Article 1(3) states that ‘no act or activity undertaken on the basis of this Protocol shall constitute grounds for claiming, contending or disputing any claim to national sovereignty or jurisdiction.’ Parties must ‘apply the measures provided for in this Protocol without prejudice to the sovereignty or the jurisdiction of other parties or other states’ and any enforcement measures must be in accordance with international law (Article 3(6)).

5.4 Relationship of the Barcelona Convention and its Protocols to UNCLOS

Parties to UNCLOS who are not parties to the Barcelona Convention must ensure that their activities in the Mediterranean comply with the provisions of UNCLOS on the marine environment. Article 3(3) of the Barcelona Convention states that ‘nothing in this Convention and its Protocols shall prejudice the rights and positions of any state concerning [UNCLOS].’ Article 3(4) provides that ‘parties shall take individual or joint initiatives compatible with international law through the relevant international organizations to encourage the implementation of the provisions of this Convention and its Protocols by all the non-party states.’

5.5 Relationship of the Barcelona Convention and its Protocols to IMO's Environmental Conventions

Parties to the VSP Conventions who are not parties to the Barcelona Convention, but who are parties to UNCLOS, must ensure that their activities in the Mediterranean comply

with the provisions of UNCLOS on the marine environment and the VSP Conventions. Article 3(4) of the Barcelona Convention applies here as well. It may even be arguable that Article 6 incorporates by reference and thus makes applicable MARPOL, OPRC and the Intervention Conventions to Barcelona Convention parties (see *also* Scovazzi, 2002).

6. Implementation, compliance and enforcement: UNCLOS and IMO Conventions on VSP with particular regard to marine biodiversity and environmental conservation affected by maritime traffic

6.1 Introduction

Article 300 of UNCLOS embodies a central underlying, unifying concept of UNCLOS that enjoying rights and benefits involves the concomitant undertaking of duties and obligations: duties must be fulfilled in good faith and rights exercised non-abusively. Article 235 holds states 'responsible for the fulfilment of their international obligations concerning the protection and preservation of the marine environment,' and states will 'be liable in accordance with international law.' With regard to VSP, UNCLOS requires states to implement, comply with, and enforce the VSP rules established by it and by other conventions, including IMO Conventions. Three types of states are involved: flag states, coastal states and port states. These types of states, their duties and obligations, the measures taken to implement, comply with, and enforce international VSP rules, and their effectiveness, are discussed below.

6.1.1 Flag states

6.1.1.1 Definition of flag states

Ships have a 'nationality' which is that 'of the state whose flag they are entitled to fly.' Flag states are those states that have granted to ships their nationality and the right to fly their flag. States must fix the conditions for this grant of nationality, for the right to fly the flag, and for registration of ships in their territory. Documents supporting the right to fly its flag must be issued to the ship by

the state granting this right. These requirements are set out in UNCLOS Article 91. 'Every state has the right to sail ships flying its flag on the high seas' (Article 90). It is a principle of international law that every state 'has the right to confer its nationality on a ship' (Sohn and Gustafson, 1984)¹⁴ and that 'determination of the criteria and establishment of the procedures for granting and withdrawing nationality to ships are matters within the exclusive jurisdiction of the flag State.'¹⁵

This right is limited in two respects. First, ships may only sail under one flag at a time and may not change their flag during a voyage or while in a port, except in the case of a real transfer of ownership or change of registry (Article 92). Second, a 'genuine link,' undefined by UNCLOS and international law, must exist between the state and the ship.¹⁶ In the continuing absence of a legally binding definition, the genuine link has so far usually been described in socio-economic terms.¹⁷ The problems with enforcing VSP rules created by the 'genuine link' lacuna are addressed below.

6.1.1.2 Duties and obligations of flag states with regard to VSP

In general, a flag state must 'effectively exercise its jurisdiction and control in administrative, technical and social matters over ships flying its flag,' including '[assuming] jurisdiction under its internal law over each ship flying its flag and its master, officers and crew in respect of [the above] matters concerning the ship' (Article 94(1) and (2)(b)).

With regard to VSP specifically, a flag state must

14 This was reaffirmed by the *M/V "SAIGA" (No. 2) case* (*Saint Vincent and the Grenadines v. Guinea*), ITLOS Judgment of 1 July 1999, para. 63.

15 See for example the *M/V "SAIGA" (No. 2) case*, *supra*.

16 'The [UNCLOS Convention's purpose] on the need for a genuine link between the ship and the flag State is to secure more effective implementation of the duties of the flag State ...' *ibid.*, para. 83; see also discussion by Churchill & Hedley (2000), and Anderson (2005).

17 The United Nations Convention on the Conditions for Registration of Ships, 1986 (Registration Convention) attempts to define the genuine link, in particular by adding socio-economic requirements (e.g. connecting the beneficial owner, crew, fleet revenues, etc., to the country of registry). It is unlikely that this Convention will enter into force. For an extensive description and discussion, see Churchill & Hedley (2000) and Behnam & Faust (2003).

'take such measures for ships flying its flag as are necessary to ensure ... that the master, officers and ... crew are fully conversant with and required to observe the applicable international regulations concerning ... the prevention, reduction and control of marine pollution' (Article 94(3) and (4)(c)). The obligation to take these necessary measures is otherwise unqualified. In taking these measures, each state must 'conform to generally accepted international regulations, procedures and practices and to take any steps which may be necessary to secure their observance' (Article 94(5)). This is another of the UNCLOS Articles by which the GAIRS set out in the IMO Conventions are made applicable to flag states. The same obligation applies to measures 'as are necessary to ensure safety at sea' (Article 94(3)). The ultimate responsibility to implement, comply with and enforce GAIRS on VSP rests clearly with the flag state and must be applied by it to all its ships sailing under its flag in all waters everywhere in the world.

Flag states must ensure that the provisions of UNCLOS Part XII on the marine environment are also complied with by ships flying their flag. The lengthy Article 217 found in Part XII is entitled 'Enforcement by flag States'. Article 217(1) sets out the obligations on flag states to:

- a) 'ensure compliance' by ships 'flying their flag or of their registry' with GAIRS and with their own laws and regulations adopted in accordance with UNCLOS,
- b) adopt their own laws and regulations,
- c) 'take other measures necessary for their implementation', and

- d) 'provide for the effective enforcement of such rules, standards, laws and regulations, *irrespective of where a violation occurs*' (emphasis added).

Article 216(1)(b) requires flag states to enforce on ships flying their flag or of their registry GAIRS for VSP and laws and regulations adopted in accordance with UNCLOS on dumping.

6.1.1.3 Effectiveness of flag state control over VSP

UNCLOS places clear, unqualified and unequivocal primary responsibility on flag states to implement and enforce compliance with VSP rules on their ships. In practice, however, the actual execution of this responsibility by many flag states is often inadequate and ineffective.¹⁸ The main reason for the unsatisfactory implementation of flag state control over VSP is that certain states exercise their right under international law to register ships to fly their flag without fulfilling their concomitant duty to control their ships as clearly required by UNCLOS. The economic advantages to ship owners of such light, if not absent, flag state control, and the associated light costs, are such that about 45 percent of the world's commercial tonnage (UNCTAD, 2005) has migrated to the major so-called 'open-registry' states,¹⁹ who register ships with which they have no 'genuine link' (see section 6.1.1.1, above). Essentially, many of these states run ship registers solely as a source of income. To remain cost-effective, the maritime administration side, including implementation and enforcement of all those flag state duties set out in UNCLOS Article 94 and the IMO Conventions, is usually necessarily kept to a minimum, and it may well be contracted out to a private business that may not even be located in the registering state.²⁰

18 The lack of effective flag state control is also a serious problem with regard to enforcement by some flag states of GAIRS on ship safety, construction, design, equipment and manning.

19 According to UNCTAD, in 2005, the principal open registries in terms of tonnage are Panama, Liberia, Bahamas, Malta, Cyprus and Bermuda. This percentage does not include the so-called 'minor' open registries. A number of small island (e.g. Vanuatu) and developing coastal states (e.g. Belize, Honduras) also maintain open registries, as do landlocked Luxembourg and Mongolia, according to UNCTAD, 2005. In the Mediterranean, Gibraltar (UK) is also listed by UNCTAD (2005) as an open registry. Many of the Mediterranean coastal states have large proportions of their own shipping flagged out to open registries, e.g. France, Greece, Italy, Turkey and Spain (UNCTAD, 2005).

20 It is neither per se wrong, nor is it illegal, to contract out execution of flag state duties as long as these are correctly met to international standards by the contractor. For example, the registers of Liberia and Marshall Islands, FOC states with reasonable reputations, are both run by the same private US commercial entity, based in the US. Nor is such contracting out unusual. Vorbach (2001) states that two-thirds of IMO Member States 'have delegated a governance function to one or more private corporations.' For example, 'members of the International Association of Classification Societies (IACS) perform compliance-checking inspections for over 100 IMO Member States.'

6.1.1.4 Flags of convenience

Ships registered and flagged in open-registry states sail under so-called ‘flags of convenience’ (FOCs). Under international law there is no agreed definition of FOCs (for a detailed discussion, see Ademun-Odeke, 2005); largely sufficient for the purposes of this paper is a succinct one employed by the International Transport Workers’ Federation (ITF): ‘a FOC ship is one that flies the flag of a country other than the country of ownership of the ship.’²¹ Location of the so-called beneficial ownership of the ship outside its country of registry makes it very difficult for the flag state to enforce its rules on the shipowners, whose responsibility it is to ensure that these rules are actually carried out on and by their ships.

Powerful economic drivers in this highly competitive industry underlie the migration by shipowners to FOCs. These drivers are by no means all sinister, nor are most shipowners irresponsible; the fact is that some national rules for some national flags make little commercial sense in a globalized economy and leave the ship owner with no choice but to register in a FOC country or cease shipping altogether (e.g. Behnam & Faust, 2003; Ademun-Odeke, 2005). It is important to recognise that not all FOC ships are substandard or particularly prone to flaunting VSP rules and not all FOC states are equally lax in meeting their obligations under international law.²² Certain ships sailing under national flags that are not FOCs are known to be substandard and to pose potential pollution risks.²³ There is often little incentive for national flags to rigorously enforce their own rules against their own ships when they know that their ships are thereby put at a competitive disadvantage against FOC ships.

Nevertheless, when gauged by objective criteria, such as port state control detentions, reports of casualties and ship losses, FOC ships are disproportionately involved.²⁴ The international community as a whole, as represented by the UN General Assembly, voiced its concern on this issue in a formal Resolution.²⁵

6.1.1.5 Assessment

Attempts to remedy this situation by restricting the flag state’s almost unlimited prerogative under international law to grant its nationality to ships have failed (for a history, see Behnam & Faust, 2003; Anderson, 2005). ‘The nationality of ships remains a well-defended preserve of sovereignty of states’ (Treves, 2004). Implementation of the comprehensive and elaborate rules on VSP set out in UNCLOS, the IMO Conventions and the Barcelona Convention and Protocols described above has been made more difficult and the marine environment suffers in consequence. Some states, concerned about the threats to their marine and coastal environment posed by FOC ships,²⁶ have begun to use their own rights and obligations under UNCLOS and IMO Conventions to protect and preserve the marine environment generally, and from VSP in particular, by enforcing compliance with VSP rules by *all* ships, *regardless of flag and UNCLOS or IMO Convention status*, navigating in their maritime zones and calling at their ports and offshore terminals (hereinafter the latter will be subsumed into ports).

Article 94(6) of UNCLOS provides one avenue of recourse against the flag state directly: ‘a state which has clear grounds to believe that proper jurisdiction and control with respect to a ship have not been exercised may report the facts

21 The ITF, which has been campaigning against FOCs since 1948 with a specific focus on improving conditions for crews, lists 27 FOCs on its website (<http://www.itfglobal.org>), including the open-registry states listed by UNCTAD.

22 For example, Panama and Liberia, by far the two largest FOC registries, have quite different international compliance reputations, at least in the Paris Memorandum of Understanding (MOU) region. See section 6.1.3.4, note 35, *below*.

23 For example, in the Mediterranean, non-FOC states Albania, Algeria and Lebanon are stated as appearing ‘year after year’ in the ‘very high risk’ category of the Paris MOU; also in this category from the region is Syria, with Egypt and Turkey just below in the ‘high risk’ category (IMO DOC FSI 14/7/4, 30 March 2006, Harmonization of Port State Control Activities); see also sections 6.1.3.4 and 6.1.3.5, *below*.

24 Although this topic is beyond the scope of this paper, FOC fishing vessels present a significant and growing marine environmental problem and threat to marine biodiversity. For current work on this issue, see <http://www.high-seas.org>, the website of the High Seas Task Force set up by the OECD.

25 UNGA Res. 59/24 on Oceans and law of the sea, 12 February 2005, paras. 38, 41, 42, 44 and 46.

26 FOC states themselves are generally at small risk of environmental damage resulting from their lack of enforcement, because the ships registered with them rarely if ever sail in their waters or call at their ports; landlocked FOC states run no risk at all.

to the flag state. Upon receiving such a report, the flag state shall investigate the matter, and, if appropriate, remedy the situation.’ This has not been much used, because when it has, little has occurred (e.g. Molenaar, 1998; Roach, 1999; Behnam & Faust, 2003; Ademun-Odeke, 2005). No cases have yet been brought before a tribunal for compulsory dispute resolution under this Article. Consequently, states now seek to enforce compliance with VSP rules on ships by using their powers under UNCLOS to do so in two, largely complementary, capacities: as coastal states and as port states (neither of which UNCLOS defines). These powers are described below.

6.1.2 Coastal states

6.1.2.1 Duties and obligations of coastal states with regard to VSP

Coastal states cannot exempt their own flag ships from complying with VSP rules; they must implement and ensure, in their adjacent maritime zones (internal waters, archipelagic waters, territorial sea, EEZ, straits, continental shelf), as well as in other states’ zones and on the high seas, compliance by ships flying *their* flag with both GAIRS and their own national laws and regulations adopted in accordance with UNCLOS. With regard to rights of and duties by coastal states to enforce VSP rules on *foreign* flag ships in their maritime zones and on the high seas, these rights and duties vary, depending on whether the coastal state is seeking to enforce these rules on a ship navigating in its maritime zones, or on a ship voluntarily in its ports, or on the high seas.²⁷

Although coastal states have certain rights to do so under UNCLOS, especially in their maritime zones,²⁸ actual enforcement *at sea* by coastal

states of VSP rules against ships rarely occurs.²⁹ This is because at-sea enforcement is difficult, costly, and subject to complex requirements under UNCLOS and international law, which tend to favour freedom of navigation generally and the non-hampering of innocent passage in particular, even in the territorial sea,³⁰ in this respect. Bearing in mind that this is a very complex issue deriving from the different rights and obligations of coastal states obtaining in each jurisdictional zone, detailed discussion of which is beyond the scope and objectives of this chapter, as a very broad rule of thumb it can be considered that coastal state enforcement rights tend to diminish the further offshore the foreign ship is.

6.1.2.2 Assessment

A detailed analysis of the differences between coastal state and port state rights would be too long for the purpose (and space restrictions) of this chapter, which is to give a background overview of the principal issues in order to inform an interdisciplinary discussion by stakeholders of practical policy options to improve compliance with VSP rules. A more detailed discussion may be found in ILA (2000), on coastal state jurisdiction, and Molenaar (1998). Subject to that caveat, and stated in brief for present purposes, it is useful to bear in mind that coastal states have a greater range of more practical options to enforce VSP rules against foreign flag ships when they do so in their capacity as port states, that is to say on a ship voluntarily in their ports. The remainder of this analysis will focus on enforcement of VSP rules through port states, from which coastal state enforcement rights will be distinguished as necessary. Where its concurrent status as a coastal state gives the port state additional options to enforce VSP rules, this will be identified.

27 Coastal states’ rights to intervene on the high seas are very limited; see *also* section 4.2.4 *above* on the Intervention Convention.

28 See for example UNCLOS Articles 19, 21, 25, 56, 73, 216(1)(a), 220(2), (5), (6), and 221.

29 This may be changing somewhat, at least for oil tankers, since the break-up of the *Prestige* off the coast of Spain in 2002, when France, Portugal and Spain announced spot inspections for all single-hulled tankers travelling through their Atlantic EEZs. For the Mediterranean, France announced in 2003 the establishment of strict controls on transiting oil tankers and its intention to intercept ships up to 90 miles off its coasts if they release polluting ballast water.

30 See for example UNCLOS Part II, Section 3, Article 211(3) and (4). In this context, UNCLOS Part III sets out rules on flag state and coastal state rights and duties with regard to compliance with environmental regulations during passage of ships through international straits and transit passage, and Part IV similarly addresses archipelagic sealanes passage, to which the same considerations limiting the practical value of *at-sea* enforcement of these rules by coastal states apply; see *also* section 6.2.2, *below*.

6.1.3 Port states

6.1.3.1 Duties and obligations of port states with regard to VSP

The basis for the extensive authority that port states may exercise over foreign ships voluntarily in their ports is that ports are entirely inside the state's sovereign territory and subject to its sovereignty.³¹ The following discussion applies to ships voluntarily in port.

Port states may (it is not obligatory) investigate and institute proceedings in respect of any discharge from a ship in its port that occurred either outside the port state's own maritime zones in violation of GAIRS, or in the maritime zones of other states if the violation has caused or is likely to cause pollution in the port state's maritime zones (UNCLOS Article 218(1) and (2)). It is obligatory for the port state to investigate 'as far as practicable' discharge violations if so requested by a state which believes these occurred in, caused, or threatened damage to the requesting state's maritime zones, or by the flag state, in the latter case irrespective of where the violation occurred (Article 218(3)).

Coastal states may (it is not obligatory) institute proceedings against ships in their ports in respect of any violation of their laws and regulations adopted in accordance with UNCLOS and GAIRS with regard to VSP when the violation has occurred in their territorial sea or EEZ (UNCLOS Article 220(1)). Detention of the ship is usually permitted.

Any state, having ascertained, 'either upon request or on [its] ... own initiative,' that a ship in port is in violation of GAIRS relating to seaworthiness and 'thereby threatens damage to the marine environment', must take administrative measures to prevent the ship from sailing; it is permissible to allow the ship 'to proceed only to nearest appropriate repair yard' in order to remove the causes of the violation, after which it must be allowed to continue immediately (UNCLOS Article

219). With regard to dumping, laws and regulations adopted in accordance with UNCLOS and GAIRS must be enforced by any state with regard to 'loading of wastes or other matter occurring within its territory or at its off-shore terminals' (UNCLOS Article 216(1)(c)). Enforcement and compliance measures must be exercised without discrimination against any other state (UNCLOS Article 227).

6.1.3.2 Access to ports

'It is also by virtue of its sovereignty that the coastal state may regulate access to its ports.'³² Article 25(2) of UNCLOS sets out the rights of protection which may be exercised by the coastal state and provides, *inter alia*, that 'the coastal state ... has the right to take the necessary steps to prevent any breach of the conditions to which admission of ... ships [to its ports] is subject,' thereby indicating that a coastal state may set conditions for access to its ports. This is further confirmed by UNCLOS Article 211(3) on VSP, which obliges states that establish particular requirements for the prevention, reduction and control of pollution of the marine environment '*as a condition for the entry of foreign vessels*' (emphasis supplied) into their ports or internal waters 'to give due publicity to such requirements' and communicate them to IMO. Ships may also be banned from entering ports, as was done by the EU for all its ports with regard to large single-hulled tankers carrying heavy-grade oil.

6.1.3.3 Effectiveness of port state control over VSP

No sooner did coastal states begin using their ports to enforce compliance with VSP rules than 'ports of convenience' (e.g. Keselj, 1999; Molenaar, 2006) emerged, that is to say ports of states with less rigorous compliance and enforcement standards. Shipping and ports are both highly competitive businesses with ample scope for 'free riders'. Attempts to address this problem all have in common the recognition that unilateral action by one state to improve its compliance

31 This was held by the ICJ to be both customary and conventional (UNCLOS) international law. *Case concerning military and paramilitary activities in and against Nicaragua (Nicaragua v. United States of America)*, ICJ Judgment of 27 June 1986, paras 212, 213.

32 *Ibid.*, para. 213. Commentators agree there is no general right of access under international law to ports.

and enforcement standards (unless it is a very large and powerful state to whose ports access is commercially vital, such as the USA) is likely to place its ports at a competitive disadvantage. It is essential to create a level playing field for ships and ports in terms of compliance with and enforcement of VSP rules. Thus, in addition to the 'no discrimination' principle and the obligation that state laws and regulations on VSP must be no less effective than the GAIRS (both are found in UNCLOS, discussed *above*), the 'no-more-favourable-treatment' (NMFT) principle was developed. This holds that port authorities must apply GAIRS to all ships, regardless of whether their flag state is a party to UNCLOS or the relevant IMO Conventions.

The next step was coordination of compliance and enforcement between authorities from different states. Such endeavours to harmonize policy are supported by UNCLOS, as in Article 211(3), for example. The perhaps most successful effort at this type of coordination so far is described below.

6.1.3.4 The Port State Control (PSC) Memoranda of Understanding

A significant multilateral development in improving the effectiveness of PSC is the almost worldwide adoption of regional PSC Memoranda of Understanding (MOUs) (see McDorman, 2000, for a review). Maritime authorities from participating states cooperate in coordinating PSC by requiring that each inspect within a given year a minimum percentage of foreign ships calling at their ports to determine whether they comply with the relevant international instruments listed in the MOU. MOUs introduce no new VSP rules. They are mechanisms to assist and, in the case of EU Member States, to oblige MOU participants to comply with their environmental, safety and other relevant obligations.

For the Mediterranean region, the two relevant MOUs are the Paris MOU and the Mediterranean

Sea MOU.³³ The Paris MOU was the first (it was initiated in 1982) and is probably still the most complex and ambitious of all the MOUs, which tend to follow it as their model. Its relevant instruments with regard to VSP include especially MARPOL and its annexes, and its annual ship inspection target is 25 percent. AFS and BWM, together with their respective PSC Guidelines, will also be included.³⁴ The Mediterranean MOU (initiated in 1997) also includes MARPOL and its annexes in its relevant instruments and its states aim to inspect 15 percent of the ships calling at their ports in a given year.

All MOUs set inspection priorities and target factors. The Paris MOU's overriding priorities include: reports about ships by pilot services, authorities, or crew members, and failure by ships to report carrying dangerous cargo or polluting goods. Target factors include: flag state on black list, targeted ship type, non-EU recognised classification society, age of the ship, flag, whether flag state has ratified all relevant conventions, entering region for first time in the last 12 months, not inspected in the last 6 months, previous detention in last 12 months, and number of deficiencies during last 12 months. For ships, there is an important positive incentive in that a record of good behaviour can reduce inspection frequency with its attendant delays and expense. The MOU participants also undertake special inspections. For example, a concentrated 3-month inspection campaign by the Paris, Tokyo and Latin American MOU participants, focusing on how requirements for preventing marine pollution from ships (MARPOL 73/78, Annex 1) have been implemented, ended on 30 April 2006. The results are being analysed and will be posted on the respective MOU websites.

The port state may require defects to be rectified and may detain ships for that purpose. Ships may also be banned from access to any port in the MOU region. Note that so far only individual ships are banned, not a (given set of) flag(s) as a whole. Lists of banned ships, current detentions,

33 From the Mediterranean region, the Paris MOU participants are: Croatia, Cyprus, France, Greece, Italy, Malta, Slovenia and Spain; the Mediterranean MOU participants are: Algeria, Cyprus, Egypt, Israel, Jordan, Lebanon, Malta, Morocco, Syria, Tunisia, Turkey and the Palestinian Authority. Not members of either MOU are Albania, Bosnia and Herzegovina, Libya, Monaco, Montenegro and Serbia.

34 IMO Doc FSI/14/7/5, 30 March 2006, Harmonization of Port State Control Activities.

and ships that have been detained, as well as black (very high risk), grey (medium risk) and white (low risk) lists of flags are posted on the Paris MOU public website (www.parisMOU.org). Note that these risky flags are not necessarily all FOCs, but they are all flown by ships found to be substandard.³⁵

Detention information must be published and include the name of the ship, the name of her owner and operator, her flag state, classification society, and the reasons for the detention. Note that detention is for the purposes of investigating a possible violation and repair; it is not permissible as a penalty for a violation. Inspection reports are recorded on a central database, and are available for search and daily updating by MOU member countries. Inspection results can be viewed on the website and are also provided to the Equasis public database. This public 'naming and shaming' is considered to be one of the most important and effective provisions of the Paris MOU.

Although the USA is not a member of any MOU, its PSC policies are compatible and the US Coast Guard, which is in charge of PSC, is equally supportive of this transparency; it maintains a similarly detailed and frequently updated list of ships, owners, classification societies and flags that have been detained or have otherwise run foul of the US PSC rules, available both on its website and in Lloyd's List (Hare, 1997).

The advantages of the regional PSC MOU approach can be summarized as follows (Plaza, 1999):

- a) enhanced control of ships in regional waters,
- b) special characteristics of the region taken into account,

- c) increased PSC transparency reduces abuse and malpractice,
- d) effective sharing of information,
- e) harmonization of regional surveys and inspections,
- f) better cost/benefit returns, e.g. avoidance of unnecessary re-inspection,
- g) avoidance of unfair competition between ports,
- h) facilitation of inter-regional cooperation,
- i) deterrent effect on export of sub-standard ships from less vigilant regions.

The Paris MOU has been made legally binding on EU Member States.³⁷ MOUs are otherwise not usually considered to be legally binding. The EU took this step because until then 'available data were showing substantial discrepancies and various degrees of non-compliance' among Paris MOU states (Schiano di Pepe, 2003). All current MOUs could be made legally binding without being inconsistent with UNCLOS. Although the Paris and the Mediterranean MOUs do not refer to UNCLOS, they are not inconsistent with UNCLOS. These MOU measures in no way intrude on the prerogatives of the flag state set out in UNCLOS. The key to the operation of PSC is a ship's voluntary entry into a port; once there, it is subject to the laws and regulations of the port state, even if those laws and regulations are based upon treaties to which its flag state is not a party. The PSC approach could be argued as assisting flag states in fulfilling the environmental obligations in the treaties to which they are a party, and more generally to protect and preserve the marine environment as required by UNCLOS (see section 2, *above*).

35 In 2004 (the last published year on the Paris MOU website as of 15.06.2006) countries in the Mediterranean region that were black-listed (in order of listing from higher to lower risk within the category) were: Albania, Algeria, Lebanon, Syria, Turkey and Egypt; grey-listed: Tunisia, Morocco, Croatia, Malta, Cyprus, Gibraltar and Spain; white-listed: Israel, Greece, France, Italy and UK. Of the remaining major FOC registries, Panama was at the bottom of the black list, and Bahamas, Liberia and Bermuda were on the white list. Malta and Cyprus moved into the white list in 2006; their joining the EU may be not unrelated to this improved status.

36 See for example Hare (1997), who also proposes that PSC is an obligation under international law for IMO Member States 'by virtue of their IMO membership alone.' The importance of 'transparency-based methods' in promoting compliance is also stressed by Schiano di Pepe (2003).

37 EU Port State Control Directive: Council Directive 95/21/EC of 19 June 1995, OJEC L157, p.1. See also discussion by Schiano di Pepe (2003).

6.1.3.5 PSC in the Mediterranean

Although the Mediterranean is covered by two MOUs, and the Mediterranean MOU is modelled on the Paris MOU, the Mediterranean MOU's capability and experience is still developing. Its website listing of annual reports and detentions is still under construction (www.medMOU.org; last accessed July 3, 2006). It does not appear to have submitted an annual report to the most recent relevant IMO meeting in April 2006 (see further in section 6.1.3.7, *below*). It is encouraging to note that this emerging MOU is receiving assistance. In December 2005, the SAFEMED project for Euro-Mediterranean Cooperation on Maritime Safety and Prevention of Pollution from Ships was launched at IMO.

'SAFEMED is a Euro 4 million EU-funded regional project established under the MEDA Programme,³⁸ to be implemented by REMPEC during 2006–2008 in Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, the Palestinian Authority, Syria, Tunisia and Turkey, under the overall coordination of the European Commission and with technical backstopping by IMO. The primary objective of SAFEMED is to mitigate the existing imbalance in and harmonize the application of maritime legislation in the region between EU and non-EU Mediterranean Partners, through promoting coherent, effective and uniform implementation of the relevant international conventions and rules aimed at better protection of the marine environment in the Mediterranean region' (IMO, 2006). SAFEMED's focus will be on, *inter alia*, Flag State Implementation (FSI) and monitoring of classification societies, and protection of the marine environment.

6.1.3.6 Port reception facilities for wastes

Discharges of wastes generated during the normal operation of ships are a principal cause of VSP. Not all discharges from ships are illegal.

MARPOL is the key instrument embodying IMO's policy of 'zero tolerance of *illegal* discharges from ships.' Crucial for the effective implementation of MARPOL is the required provision in all ports of MARPOL parties of adequate reception facilities for these wastes. If facilities are available, ships may be less inclined to discharge illegally into the sea, an activity which is particularly difficult to prosecute even if there were optimal cooperation between flag, coastal and port states, because it is hard to identify the culprit. The presence of adequate reception facilities in the adjacent ports is particularly important when countries would like their coastal areas to be designated as MARPOL Special Areas or PSSAs, or if they have established SPAMIs or MCPAs.

As discussed above in sections 4.2.1.1 and 4.2.1.5, the entire Mediterranean has been designated a MARPOL Special Area under Annexes I and V, but the absence of adequate waste reception facilities has not enabled the Special Area provisions to come into effect, to the consequent detriment of the particularly vulnerable marine environment of the Special Area. Achieving compliance by MARPOL parties with this requirement is a long-standing problem of such apparent intractability (for a detailed discussion of the likely reasons for this problem, see Mitchell *et al.*, 1999) that it has attracted the formally expressed concern of the UN General Assembly.³⁹ The EU has promulgated a directive⁴⁰ binding on its Member States, but its implementation is also proving to be problematic for many of the same reasons that implementation of the MARPOL requirement has been so difficult: in particular because no agreement has been reached on who is to pay for these facilities (e.g. Swift, 2005). The most recent initiative involves cooperation between IMO and a new Reception Facilities Forum, set up by a group of industry NGOs representing major port and shipping interests; they are drafting an action plan to address specific problems associated with this waste reception facilities issue.⁴¹

38 The Mediterranean Economic Development Assistance (MEDA) programme is the principal EU instrument to implement the Euro-Mediterranean Partnership, which offers technical and financial support to reform economic and social structures in the Mediterranean Partners.

39 UNGA RES/60/30, 29 November 2005.

40 Directive 2000/59/EC of 27 November 2000; OJEC L 332, 28 December 2000, pp. 81-90.

41 IMO DOC FSI/14/13, 1 November 2005.

6.1.3.7 Assessment of port state control

IMO's PSC 'policy aims at achieving a global coverage through PSC regional inputs, which, once operational and effective, will deprive substandard ships of any area of operation' (Plaza, 1999). It is important to recall that PSC was never meant to replace flag state control, but rather to complement it. The reluctance by ports to undertake PSC at all, even at the currently operative level with its attendant costs, reflects the view of port states that they are executing what is primarily a flag state responsibility. In 1992 IMO established a sub-committee on FSI, 'with the primary objective of identifying measures necessary to ensure proper global implementation of the IMO instruments and compliance with their requirements' (Plaza, 1999).

The FSI sub-committee had its 14th meeting in April 2006. The bulk of its agenda focused on PSC, including the draft action plan on port waste reception facilities (see section 6.1.3.6, above) and the harmonization of PSC activities between regions, rather than on direct FSI issues. Its (voluntary) Flag State Self-Assessment Audit is still having difficulties. Deregistration is a growing response by some flag states to deal with their problem ships, rather than exercising their enforcement duties, as is deregistration by ship owners of their ships from PSC-targeted flags to either new flags without a track record or to other, probably equally complaisant but less PSC-targeted flags (Roach, 1999). This

deregistration and flag-hopping issue is not yet being addressed in the FSI sub-committee, and underlines the need for continuing and even more sophisticated PSC control. Consequently, the growing scale and scope of PSC as it is exercised today is a direct consequence of the continuing absence of effective flag state control, and PSC is likely to remain the principal vehicle for enforcing compliance with VSP rules for the foreseeable future.

6.1.4 Summary

It may be difficult for a flag state to successfully argue that its non-party status with regard to UNCLOS and the IMO Conventions allows it under international law to permit its ships to ignore the rules set out to protect and preserve the marine environment in general and to combat VSP in particular; to date, however, to the best of this author's knowledge, this particular issue has not yet been adjudicated. For Mediterranean flag states operating in the Mediterranean Sea, asserting this claim will also be more difficult because all the Mediterranean coastal states are party to either the original Barcelona Convention or to its amended version.

The fact that most of the Mediterranean is high seas (e.g. Scovazzi, 1996; Scovazzi, 2002; Chevalier, 2005) is irrelevant to the obligations of the flag state under UNCLOS and the IMO Conventions, whether it is a Mediterranean state or not, because it is obliged to apply the relevant rules in these instruments to all of its ships

Table 1.1 – Summary of vessel-source pollution (VSP) enforcement authority by flag, port and coastal states (P, party; S, signatory; NP, non-party; NS, non-signatory).

	Flag State	Port State	Coastal State
UNCLOS P/S and IMO Conv. NP/NS	All necessary and appropriate action* to implement UNCLOS and IMO Conventions for its ships anywhere in the world	All necessary and appropriate action* to implement UNCLOS and IMO Conventions if ship is voluntarily in port	All necessary and appropriate action* in maritime zones (MZ) or if VSP threatens MZ or if ship is voluntarily in port to implement UNCLOS and IMO Conventions
UNCLOS NP and IMO Conv. NP	All necessary and appropriate action* anywhere in the world insofar as UNCLOS represents customary international law	All necessary and appropriate action* insofar as UNCLOS represents customary international law if ship is voluntarily in port	All necessary and appropriate action* in maritime zones (MZ) or if VSP threatens MZ or if ship is voluntarily in port insofar as UNCLOS represents customary international law

* in accordance with UNCLOS and/or customary international law

anywhere in the world. This is also the case for ships voluntarily in the harbours or internal waters of port states, by virtue of the sovereignty of port states over all ships there, regardless of flag, with regard to VSP.

The high-seas status of much of the Mediterranean Sea does make it more difficult for the Mediterranean coastal state to intervene with regard to navigating ships, especially outside its territorial sea. However, as seen above, high-seas freedoms are subject to Part XII and must be exercised with 'due regard for the interests of other states'; therefore, in this author's view, a Mediterranean coastal state may be able to argue successfully that even a high-seas intervention, and an intervention in its EEZ or territorial sea, could be justified if these zones were threatened or actually damaged by VSP.

Bearing in mind the legal and zonal complexities involved, Table 1.1 attempts to give a broad rule-of-thumb summary of the enforcement authority over VSP by flag states, port states and coastal states for UNCLOS parties and signatories who are also IMO Convention non-parties or non-signatories, and for UNCLOS non-parties who are also IMO Convention non-parties or non-signatories.

6.2 Options for IUCN-Med to assist in improving compliance with VSP rules

6.2.1 Overview of current approaches to improving compliance with VSP rules

6.2.1.1 Non-state actors in the shipping community

In the continuing absence of effective action by some flag states to enforce the VSP rules, and given the inability of the international community to refine the rules of international law governing ship registration (by redefining the 'genuine link',

for example, or otherwise restricting the rights of states to register ships), other interested parties with a stake in environmentally responsible shipping are increasingly becoming involved. In addition to the coastal and port state actions discussed in section 6.1, *above*, important initiatives are being undertaken by non-state actors active in the shipping business, such as certain classification societies, protection and indemnity (P&I) clubs, and shippers and shipowners' associations (e.g. Roach, 1999; Vorbach, 2001, for descriptions of the actions undertaken by industry NGOs). Such groups play important roles in the network of arrangements without which a ship, even with a flag, cannot go to sea.

A common element in these initiatives is that, regardless of what the ship's flag state may (or may not) require, if shipowners wish to avail themselves of the services offered by these groups, they have to operate by their rules, which are becoming steadily more environmentally responsible. These groups try to maintain the highest reputation, such that, for example, in the case of IACS, classification by one of its members comes with a sufficient guarantee of quality that the port state will be less inclined to place ships classified by IACS on a priority inspection target list.⁴²

Raising the cost of an environmentally irresponsible option or of a violation of a VSP rule, such that its cost is greater than the economic benefits of irresponsibility or violation, or removing the option or the decision to violate a rule entirely from the available choices (for example, by ensuring that the option is not available through insurers or classification societies), are effective approaches in promoting compliance. As industry NGOs set increasingly higher standards and apply other market-based initiatives that force compliance and reduce opportunities for substandard operators, these approaches can operate to prevent as well as to deter violations.⁴³

42 The Paris MOU also records deficiencies which classification societies are responsible for catching ('class-related deficiencies and detentions'); performance in that regard is closely linked to PSC targeting decisions and the reputation of the classification society. These are also linked to type of flag. The performance of classification societies with high reputations is usually linked to reputable flags, and vice-versa (see IMO DOC FSI 14/INF 2, Harmonization of Port State Control Activities).

43 For a detailed discussion that compares and analyses the reasons for the very different compliance success between three IMO subregimes to deal with three types of VSP, see Mitchell et al. (1999). See also Vorbach (2001) on industry NGO approaches to address VSP, and Schiano di Pepe (2003) and Molenaar (2006) on approaches to improve compliance.

6.2.1.2 Litigation

Despite ample provision under UNCLOS for various forms of dispute resolution, and suggestions by commentators that this might be a useful avenue to pursue (e.g. Anderson, 2005), coastal and port states do not seem to be taking flag states to the ICJ, ITLOS or arbitration over allegations of dereliction of duty with regard to VSP. A number of likely reasons for this include: time, expense and the fact that, even if the flag state were declared to be delinquent, the judgement would only be applicable between the parties for the case in question and the tribunals have no means to enforce their judgements. Finding, prosecuting, convicting and collecting from the shipowner would be at least as complicated. Most importantly, even if law suits were successful under both scenarios, the overall problem of day-to-day enforcement of the VSP rules would still remain.

An authoritative ruling by the ICJ or ITLOS that, for example, IMO's GAIRS are indeed applicable to UNCLOS parties who are non-parties to IMO's Environmental Conventions would be helpful, but obtaining such a ruling would be expensive and the outcome is not guaranteed. Furthermore, such a ruling may not necessarily spur flag state compliance, because it is more likely that flag states are not complying with their VSP enforcement obligations because they are unwilling or unable to do so and can avoid complying with relative impunity, than because they take the view that they are not in fact obliged to do so under international law.

Note, however, that flag states are taking coastal states to the ITLOS (under its relatively rapid provisional measures procedures) over alleged unjustified detention of ships, so far with regard to alleged illegal fishing by the flag, not yet for VSP.⁴⁴ This shows that flag states are not as reluctant to assert their *rights* in international law

as they seem to be in assuming their concomitant *responsibilities*. Such flag state action also demonstrates the enforcement power of ship detention, which is why it figures so prominently in the MOU VSP enforcement portfolio.

6.2.1.3 Denial of port access

While it is accepted that specific ships are denied access to ports under the PSC Memoranda (see discussion in section 6.1.3.4, *above*), Directive 2001/106/EC provides for the banning of entire flags from EU ports if certain conditions are met, including flying a Paris MOU black-listed flag (Schiano di Pepe, 2003). This measure has substantial potential to enhance VSP⁴⁵ enforcement efforts.⁴⁶ If implemented by all ports throughout an entire region, such as the Mediterranean Sea, significant improvements in compliance with VSP rules should occur. Ideally, recalcitrant targeted flag states, whose ships wish to trade in the region, would be spurred on to set and enforce VSP standards.

Less suitable for the marine environment of other regions, however, is the risk that non-compliant ships of targeted flags may avoid those ports in the region where the ban is operative. Currently, as the ban is applicable only to EU Member States, the risk is that non-compliant ships will head for ports in the Mediterranean where the ban does not operate. As with PSC, where the risk also exists that ships head for less rigorous ports in order to avoid inspection, in the Mediterranean those ports are likely to be predominantly in the non-EU, non-Paris MOU coastal states. Many of these states, as discussed above, already have some difficulty with compliance and enforcement of VSP rules, both individually and through the emerging Mediterranean MOU. Some, albeit specifically in their capacity as flag states, not as port states, are already black-listed by the Paris MOU. Nevertheless, port access denial is a potentially useful additional mechanism to

44 See for example the *M/V "SAIGA" (No. 2)* case, in note 14 to section 6.1.1.1, *above*.

45 Denial of port access also has important potential for improving compliance with the IMO Conventions dealing with safety, design, equipment and manning of ships.

46 If correctly applied, such a ban does not risk running foul of the World Trade Organization agreements as a trade-related environmental measure; see for example McDorman (2000); Boyle (2005). Such entire flag bans are standard procedure in the international aviation industry, where airlines are not even permitted to overfly, let alone land, in other countries, if their planes *and* their *national* airports do not meet international standards set by the International Civil Aviation Organization; see for example Roach (1999); Ademun-Odeke (2005).

encourage compliance with and enforcement of VSP rules that merits further investigation for its wider applicability, particularly in an enclosed or semi-enclosed sea like the Mediterranean.

6.2.2 Possible contributions by IUCN-Med to improving compliance with VSP rules

6.2.2.1 IMO's Conventions

- **Participation**

Effective and consistent action against VSP in the Mediterranean requires participation by all coastal states in the relevant Conventions as parties, even for those Conventions that are already in force. It is also urgently necessary that BWM and AFS enter into force. Adherence to them by all the Mediterranean coastal states would advance this goal significantly. IUCN already has a formal policy of encouraging membership in conventions; for the Mediterranean, a region-specific enhanced IMO Convention membership drive could be developed. This would be especially relevant and useful to the non-EU Mediterranean coastal states, whose marine environment is already suffering disproportionately from the movement of substandard and polluting shipping. Although this has not yet been formally adjudicated by a court, a number of commentators and this author consider that non-parties are obliged to comply with the IMO Conventions that are in force.

Becoming parties to these Conventions will permit current non-party states to participate in the continuing development of these Conventions, increase their eligibility for assistance with their implementation as flag, coastal and port states, and benefit their immediate marine environment, as well as that of the Mediterranean as a whole. An initial focus could be on those Mediterranean coastal states who are also IUCN members, with the first effort designed to ascertain the factors⁴⁷ that are inhibiting their joining the IMO Conventions.

- **Implementation and compliance**

It is also essential that current parties continue to review and, where necessary, improve their implementation of and compliance with the IMO Conventions. How IUCN-Med might assist in this is discussed in sections 6.2.2.2–6.2.2.5, *below*.

6.2.2.2 MOUs

Much the same rationale as outlined in section 6.2.2.1 *above* applies to assistance by IUCN-Med in achieving Mediterranean-wide membership and implementation of, as well as compliance with, the two relevant PSC MOUs. An initial strategy for implementing this approach by IUCN-Med could be similar to that described above for the IMO Environmental Conventions.

6.2.2.3 National environment ministries

Where IUCN-Med works with national environment ministries, it could raise their awareness of the possible deleterious effects of maritime traffic on the marine environment generally, and on their marine parks, reserves, SPAs, Special Areas and PSSAs specifically, and of their international and regional legal obligations to address these effects. It could then encourage their cooperation with the national shipping and other relevant specialized or sectoral ministries (e.g. ports and harbours) to join (if necessary) and implement IMO's VSP Conventions. Such inter-ministerial cooperation would assist in mobilizing technical and financial support for implementing activities that meet shared environmental objectives which one ministry acting alone would be unlikely to achieve. Again, the initial effort by IUCN-Med could be directed at non-EU Member States in the Mediterranean region.

6.2.2.4 Other current and potential partners of IUCN and of IUCN-Med

These could be informed of IUCN-Med's interest in contributing to achieving Mediterranean-wide implementation of and compliance with the VSP rules set out in IMO Conventions and the dumping

⁴⁷ Such factors should include the financial cost of membership in the various Conventions, including costs of staffing and attending meetings of the parties.

rules set out in LC and LCP, as well as adherence to the Conventions themselves, and of IUCN-Med's proposed initiatives in that respect; their cooperation and further input towards refining these and developing other initiatives could be requested. Included in this group of partners should be IMO itself, REMPEC, the Barcelona Convention secretariat and the secretariat of the London Convention/Protocol, the Mediterranean EU Member States, the relevant Mediterranean parts of the European Commission's environment and shipping directorates, as well as the Mediterranean representatives of the major international and regional private sector NGOs dealing with shipping, and of other major national, regional and international NGOs dealing with the marine environment.

6.2.2.5 A Mediterranean consultative forum on compliance with VSP rules

One further initiative that could be discussed with all the actors mentioned in the immediately preceding subsections would be the utility of convening a Mediterranean-specific consultative forum on environmentally responsible shipping that would focus on practical means of improving compliance with IMO's VSP rules. Representatives of all the actors, especially from industry, should be present. Topics might include:

- a) regional cooperation to build port state inspection and enforcement capability (building expertise to enforce discharge violations, similar to the Monitoring,

Surveillance and Control network that has been developed to help fisheries enforcement officers);

- b) building a regional block within IMO to propose and promote stronger discharge regulations (Japan has been working on technology that would eliminate the need to discharge oily wastes);
- c) promoting an amendment to MARPOL Annex I to prohibit all oil discharges;
- d) regional assistance in helping build reception facilities;
- e) exploring the feasibility and potential effectiveness of denial of port access throughout the Mediterranean to black-listed flags in achieving their compliance with VSP rules;
- f) a collaborative project to identify Mediterranean areas that are both sensitive and at high risk of damage from shipping (note that this project could include more than potential VSP damage and also address questions such as ship strikes of marine mammals, noise, reduction of collision and grounding risks, coastal states and straits issues, etc.), and then assess the best means to address them, through, for example, improved routing and traffic control, special discharge regulations, areas to be avoided, etc.

7. Conclusions

Shipping is subject to probably the most intricate set of rules extant dealing with the threats arising from one sector's activities in the marine environment. It will be evident from even the brief summaries given above that each of these many instruments sets out to be as comprehensive as possible in light of the existing and foreseeable circumstances that could threaten the marine environment and biodiversity and the commercial and political realities that obtained when they were negotiated and updated. Not even the most fully implemented and enforced regimes would be able to prevent new threats arising, or existing threats changing, or the previously negotiated responses to threats being seen as (becoming) inadequate. For example, the distance-from-land criterion in the MARPOL discharge regime may no longer be appropriate to address even existing threats from oil, chemicals, sewage, and garbage. Tonnage exceptions may need to be revisited. Although MARPOL Annex VI only recently entered into force, the conditions under which it was promulgated have changed sufficiently meanwhile that its revision is already being considered. There will always be a need for new or additional measures to address new or changing threats and all the conventions provide mechanisms for this.

With regard to the maritime sector, as new marine environmental threats emerge from it, the maritime community under the auspices of IMO tries to develop further instruments, usually also legally binding, to address them, or it amends existing instruments as necessary. Two such emerging threats are the scrapping of ships and the sequestration of carbon dioxide in sub-seabed geological formations. These are now being dealt with: the former is expected to result in a convention and the latter is being handled by amending the London Convention Protocol. MARPOL's Annexes are constantly being updated and amended, usually by a particularly efficient tacit acceptance procedure.

The threats posed by maritime traffic to marine biodiversity and the marine environment are addressed by UNCLOS, IMO's Environmental Conventions and the Barcelona Convention, as well as by other global environmental conventions, in particular CBD and the Basel Convention. These Conventions reinforce each other, are complementary, and are all strengthened by the existence of UNCLOS. As new environmental threats from maritime traffic emerge, IMO in particular is able to develop appropriate, globally binding regulatory responses, and to do so relatively swiftly. The level of global acceptance of IMO's Environmental Conventions is such that the GAIRS set out therein are considered by many to be universally applicable, in large part by virtue of the existence of UNCLOS. Even those few states who are non-signatory non-parties to both UNCLOS and IMO's Environmental Conventions have had to accept their application, especially by port states, but also by coastal states, to ships flying their flag.

The principal problem with regard to the marine environmental effects of maritime traffic lies in obtaining effective compliance with and enforcement of these instruments. The primary responsibility for this lies with flag states. Because some flag states' execution of this responsibility is inadequate, port states are increasingly assuming compliance and enforcement functions, and they apply UNCLOS and IMO standards to all non-compliant ships in their ports. Non-state actors in the maritime sector are also endeavouring to ensure that the GAIRS set out in these instruments over which they have some control are applied by them to all ships, regardless of what the flag state may—or may not—require. This chapter has therefore focused on offering a number of different options whereby IUCN-Med could assist in achieving compliance with and enforcement of these instruments, to the benefit of marine biodiversity and marine environmental conservation in the Mediterranean.

8. References

Ademun-Odeke (2005).

'An examination of bareboat charter registries and flag of convenience registries in international law'. *Ocean Development & International Law*, 36:339–362.

Anderson, D. (2005).

'Developments in respect of high seas navigation', provisional text, subject to revision, of a paper presented at the Symposium on the Law of the Sea, 22–23 March, 2005, British Institute of International and Comparative Law, London, UK.

Behnam, A. and Faust, P. (2003).

'Twilight of flag state control'. *Ocean Yearbook*, 17:167–192.

Birnie, P. and Boyle, A.E. (2002).

International Law and the Environment, 2nd ed. Oxford, UK: Oxford University Press.

Blanco-Bazán, A. (2003).

'The environmental UNCLOS and the work of IMO in the field of prevention of pollution from vessel sources'. In: A. Kirchner (ed.), *International Maritime Environmental Law*, pp.31–48. London, UK, The Hague, the Netherlands, and Boston, Massachusetts: Kluwer Law International.

Boyle, A.E. (2005).

'Further development of the 1982 Law of the Sea Convention: mechanisms for change', a paper presented at the Symposium on the Law of the Sea, 22–23 March, 2005, British Institute of International and Comparative Law, London, UK.

Chevalier, C. (2005).

Governance of the Mediterranean Sea: Outlook for the legal regime. Málaga, Spain: IUCN-Med.

Churchill, R.R. and Hedley, C. (2000).

The meaning of the 'genuine link' requirement in relation to the nationality of ships. London, UK: International Transport Workers' Federation. Available at <http://www.itfglobal.org/seafarers/icons-site/images/ITF-Oct2000.pdf>, accessed June 15, 2006.

Freestone, D. (1996).

'The conservation of marine ecosystems under international law'. In: M. Bowman and C. Redgwell (eds), *International law and the conservation of biological diversity*, pp.91–108. London, UK, The Hague, the Netherlands, and Boston, Massachusetts: Kluwer Law International.

Hare, J. (1997).

'Port state control: strong medicine to cure a sick industry'. *Georgia Journal of International and Comparative Law*, 26(3):571–594. Republished and updated on 15 June 2000 at <http://www.uct.ac.za/depts/shiplaw/pscfrm.htm>, accessed June 15, 2006.

ILA (International Law Association) (2000a).

'Coastal state jurisdiction relating to marine pollution: Final report'. In: A.H.A. Soons and C. Ward (eds), *Report of the 69th ILA Conference*, pp.443–512. London, UK: ILA.

ILA (International Law Association) (2000b).

'Formation of general customary international law: Final report'. In: A.H.A. Soons and C. Ward (eds), *Report of the 69th ILA Conference*, pp.712–790. London, UK: ILA.

IMO (International Maritime Organization) (2006).

'SAFEMED project launched at IMO'. *IMO News*, 2006(1):28. Available online at http://www.imo.org/newsroom/mainframe.asp?topic_id=11

Keselj, T. (1999).

'Port state jurisdiction in respect of pollution from ships: the 1982 UNCLOS and Memoranda of Understanding'. *Ocean Development & International Law*, 30:127–160.

McDorman, T.L. (2000).

'Regional port state control agreements: some issues of international law'. *Ocean and Coastal Law Journal*, 5:207–227.

Mitchell, R., McConnell, M.L., Roginko, A. and Barrett, A. (1999).

'International vessel-source oil pollution'. In: O.R. Young (ed.), *Effectiveness of International Environmental Regimes*, pp.33–90. Boston, Massachusetts: MIT Press.

Molenaar, E.J. (1998).

Coastal state jurisdiction over vessel-source pollution. London, UK, The Hague, the Netherlands, and Boston, Massachusetts: Kluwer Law International.

Molenaar, E.J. (2006).

'Developments in port state jurisdiction, towards mandatory and comprehensive use'. In: R. Barnes, D. Freestone and D. Ong (eds), *The Law of the Sea: Progress and prospects*, pp.192–209. Oxford, UK: Oxford University Press.

Oxman, B. H. (1991).

'The duty to respect generally accepted international standards'. *New York University Journal of International Law and Politics*, 24:109–159.

Oxman, B.H. (1995).

'The role of the International Maritime Organization'. In: M. Kusuma-Atmadja, T.A. Mensah and B.H. Oxman (eds), *Sustainable development and preservation of the oceans: The challenges of UNCLOS and Agenda 21, Proceedings of the 29th Annual Conference of the Law of the Sea Institute, June 19–22, 1995, Bali, Indonesia*, pp. 266–284. Honolulu, Hawaii: The Law of the Sea Institute, William S. Richardson School of Law, University of Hawaii.

Plaza, Fernando (1999).

'Flag state implementation and port state control issues'. Paper presented at the 23rd Annual Seminar on Current Maritime Issues and the Work of the International Maritime Organization, co-sponsored by IMO and the Center for Oceans Law and Policy, University of Virginia School of Law, January 6–8, 1999, IMO, London, UK.

Roach, J.A. (1999).

'Alternatives for achieving flag state implementation and quality shipping'. Paper presented at the 23rd Annual Seminar on Current Maritime Issues and the Work of the International Maritime Organization, co-sponsored by IMO and the Center for Oceans Law and Policy, University of Virginia School of Law, January 6–8, 1999, IMO, London, UK.

Schiano di Pepe, L. (2003).

'Port state control as an instrument to ensure compliance with international marine environmental obligations'. In: A. Kirchner (ed.), *International maritime environmental law*, pp.137–156. London, UK, The Hague, the Netherlands, and Boston, Massachusetts: Kluwer Law International.

Scovazzi, T. (1996).

'The recent developments in the "Barcelona system" for the protection of the Mediterranean against pollution'. *International Journal of Marine and Coastal Law*, 11:95–100.

Scovazzi, T. (2002).

The revision of MAP legal framework: the Barcelona Convention and its Protocols. Athens, Greece: UNEP Coordinating Unit for the Mediterranean Action Plan.

Sohn, L.B. and Gustafson, K. (1984).

The Law of the Sea. St. Paul, Minnesota: West Publishing Company.

Swift, P.M. (2005).

'Tanker safety and pollution prevention—Port entry issues'. Paper presented at the International Seminar on Tanker Safety, Pollution Prevention & Spill Preparedness, 8 December 2005, Shanghai, China. Available at <http://www.intertanko.com/templates/DocumentList.aspx?id=20528>, last accessed 30 June 2006.

Treves, T. (2004).

'Flags of convenience before the Law of the Sea Tribunal'. *San Diego International Law Journal*, 6:179–190.

UNCTAD (United Nations Conference on Trade and Development) (2005).

Review of Maritime Transport 2005. New York, USA, and Geneva, Switzerland: United Nations.

Van Dyke, J.M. (2004).

'Giving teeth to the environmental obligations in the LOS Convention'. In: A. G. Oude Elferink and D. R. Rothwell (eds), *Oceans management in the 21st century: Institutional frameworks and responses*, pp.167–186. Leiden, the Netherlands: Koninklijke Brill.

Vorbach, J. (2001).

'The vital role of non-flag state actors in the pursuit of safer shipping'. *Ocean Development & International Law*, 32:27–42.

9. Further reading

Birnie, P. (1997).

'Status of environmental "soft law": trends and examples with special focus on IMO norms'. In: H. Ringbom (ed.), *Competing norms in the law of marine environmental protection: Focus on ship safety and pollution prevention*, pp.31–57. London, UK, The Hague, the Netherlands, and Boston, Massachusetts: Kluwer Law International.

Boyle, A.E. (1997).

'UNCLOS, the marine environment, and the settlement of disputes', in H. Ringbom (ed.), *Competing norms in the law of marine environmental protection: Focus on ship safety and pollution prevention*, pp.241–256. London, UK, The Hague, the Netherlands, and Boston, Massachusetts: Kluwer Law International.

Churchill, R.R. and Lowe, A.V. (1999).

The Law of the Sea, 3rd ed.. Manchester, UK: Manchester University Press.

de Dieu, J. (1997).

'EU policies concerning ship safety and pollution prevention vs. international rule making'. In: H. Ringbom (ed.), *Competing norms in the law of marine environmental protection: Focus on ship safety and pollution prevention*, pp.141–164. London, UK, The Hague, the Netherlands, and Boston, Massachusetts: Kluwer Law International.

de la Fayette, L. (1996).

'Access to ports in international law'. *International Journal of Marine and Coastal Law*, 11:1–22.

Franckx, E. (1998).

'Regional marine environment protection regimes in the context of UNCLOS'. *International Journal of Marine and Coastal Law*, 13:307–324.

IMO (International Maritime Organization) (2005).

Implications of the entry into force of the United Nations Convention for the Law of the Sea for the International Maritime Organization, DOC/LEG/MISC/4, IMO, London, UK.

Kasoulides, G.C. (1997).

'Global and regional port state regimes'. In: H. Ringbom (ed.), *Competing norms in the law of marine environmental protection: Focus on ship safety and pollution prevention*, pp.121–139. London, UK, The Hague, the Netherlands, and Boston, Massachusetts: Kluwer Law International.

Kimball, L.A., Johnston, D.M., Saunders, P.M. and Payoyo, P. (1995).

The Law of the Sea: Priorities and responsibilities in implementing the Convention. Gland, Switzerland: IUCN.

Kimball, L.A. (2003).

International ocean governance: Using international law and organizations to manage marine resources sustainably. Gland, Switzerland, and Cambridge, UK: IUCN.

Oxman, B. H. (1996).

'The rule of law and the United Nations Convention on the Law of the Sea'. *European Journal of International Law*, 7(3):353-371. Available at <http://www.ejil.org/journal>; accessed June 15, 2006.

Roach, J.A. (1995).

'Responsibilities and rights of other states'. In: M. Kusuma-Atmadja, T.A. Mensah and B.H. Oxman (eds), *Sustainable development and preservation of the oceans: The challenges of UNCLOS and Agenda 21, Proceedings of the 29th Annual Conference of the Law of the Sea Institute, June 19–22, 1995, Bali, Indonesia*, pp.225–265. Honolulu, Hawaii: The Law of the Sea Institute, William S. Richardson School of Law, University of Hawaii.

Rothwell, D.R. and Stephens, T. (2004).

'Dispute resolution and the Law of the Sea: Reconciling the interaction between the Law of the Sea Convention and other environmental instruments'. In: A.G. Oude Elferink and D. R. Rothwell (eds), *Oceans management in the 21st century: Institutional frameworks and responses*, pp.209–230. Leiden, the Netherlands: Koninklijke Brill.

Treves, T. (2003).

'Regional approaches to the protection of the marine environment'. In: M.H. Nordquist, J.N. Moore and S. Mahmoudi (eds), *The Stockholm Declaration and law of the marine environment*, pp.137–154. London, UK, The Hague, the Netherlands, and Boston, Massachusetts: Kluwer Law International.

Valenzuela, M. (1995).

'The role of the United Nations and other competent international organizations in the future development of law for the protection of the marine environment: Selected topics'. In: M. Kusuma-Atmadja, T.A. Mensah and B.H. Oxman (eds), *Sustainable development and preservation of the oceans: The challenges of UNCLOS and Agenda 21, Proceedings of the 29th Annual Conference of the Law of the Sea Institute, June 19–22, 1995, Bali, Indonesia*, pp.673–699. Honolulu, Hawaii: The Law of the Sea Institute, William S. Richardson School of Law, University of Hawaii.

Van Dyke, J.M (2005).

'The disappearing right to navigational freedom in the Exclusive Economic Zone'. *Marine Policy*, 29:107–121.

Convention Concerning the Protection of the World Cultural and Natural Heritage, 1972 (World Heritage

10. Conventions

Convention), 11 *International Legal Materials* 1358.

Available online at <http://whc.unesco.org/en/conventiontext/>

Convention for the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972 (London Convention), 11 *International Legal Materials* 1294, and its 1996 Protocol, 36 *International Legal Materials* 1.

Available online at http://www.imo.org/home.asp?topic_id=1488

Convention for the Protection of the Marine Environment and the Coastal Regions of the Mediterranean, 1995 (Barcelona Convention) and its seven Protocols (Protocols 1, 5 & 7 not in force).

Available online at <http://www.unepmap.org/>

Convention on Biological Diversity, 1992 (CBD), 31 *International Legal Materials* 818.

Available online at <http://www.cbd.int/convention/about.shtml>

Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, 1989 (Basel Convention), 28 *International Legal Materials* 657.

Available online at <http://www.basel.int/>

Convention on the Conservation of Migratory Species of Wild Animals, 1979 (Bonn/CMS Convention), 19 *International Legal Materials* 15.

Available online at <http://www.cms.int/documents/index.htm>

Convention on Wetlands of International Importance especially as Waterfowl Habitat, 1971 (Ramsar Convention), 996 *U.N.T.S.* 245.

Available online at http://www.ramsar.org/key_conv_e.htm

International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004 (BWM Convention). London, UK: IMO. (Not in force.)

Information available at http://www.imo.org/Conventions/mainframe.asp?topic_id=867

International Convention for the Prevention of Pollution from Ships, 1973 (MARPOL), as modified by the Protocol of 1978, and its six Annexes.

Available online at http://www.imo.org/InfoResource/mainframe.asp?topic_id=783.

Information available at http://www.imo.org/Conventions/contents.asp?doc_id=678&topic_id=258

International Convention on Oil Pollution Preparedness, Response and Co-operation, 1990 (OPRC Convention) and its 2000 Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances (HNS Protocol). London, UK: IMO.

Information available at http://www.imo.org/Conventions/mainframe.asp?topic_id=258&doc_id=682

International Convention on the Control of Harmful Anti-fouling Systems on Ships, 2001 (AFS Convention). London, UK: IMO. (Enters into force in September 2008.)

Information available at http://www.imo.org/Conventions/mainframe.asp?topic_id=529

International Convention relating to Intervention on the High Seas in Cases of Oil Pollution Casualties, 1969 (Intervention Convention) and its 1973 Protocol covering substances other than oil. London, UK: IMO.

Information available at http://www.imo.org/Conventions/mainframe.asp?topic_id=258&doc_id=680

United Nations Convention on Conditions for Registration of Ships, 1986 (Registration Convention), 26 *International Legal Materials* 1229.

Available online at <http://www.admiraltylawguide.com/conven/registration1986.html>

United Nations Convention on the Law of the Sea, 1982 (UNCLOS), 21 *International Legal Materials* 1261.

Available online at http://www.un.org/Depts/los/convention_agreements/texts/unclos/closindx.htm

Vienna Convention on the Law of Treaties, 1969, 1155 *U.N.T.S.* 331.

Available online at http://untreaty.un.org/ilc/texts/instruments/english/conventions/1_1_1969.pdf

Appendix A. Mediterranean coastal State Parties to UNCLOS and relevant IMO Conventions

	LOS	MPI/II	MPIII	MPIV	MPV	MPVI	LC/LCP	OPRC/HNS	INT/P
Albania	P	P	P	P	P	N	N/N	P/N	N/N
Algeria	P	P	P	P	P	N	N/N	P/N	N/N
Bosnia and Herzegovina	P	N	N	N	N	N	N/N	N/N	N/N
Croatia	P	P	P	P	P	P	P/N	P/N	P/P
Cyprus*	P	P	P	P	P	P	P/N	N/P	N/N
Egypt*	P	P	P	P	P	N	P/P	P/P	P/P
European Union	P								
France*	P	P	P	P	P	P	P/P	P/P	P/P
Greece*	P	P	P	P	P	P	P/N	P/P	N/N
Israel	N	P	P	N	N	N	N/N	P/N	N/N
Italy*	P	P	P	P	P	P	P/P	P/N	P/P
Lebanon*	P	P	P	P	P	N	N/N	P/N	P/N
Libya*	S	P	P	P	P	N	P/N	P/N	N/N
Malta	P	P	P	N	P	N	P/N	P/P	N/N
Monaco*	<i>P</i>	P	P	P	P	N	P/N	P/N	P/N
Montenegro	<i>P</i>	P	P	P	P	N	P/N	N	P/P
Morocco*	P	P	P	P	P	N	P/N	P/P	P/P
Serbia	P	P	P	P	P	N	P/N	N/N	P/P
Slovenia	P	P	P	P	P	P	P/P	P/P	P/P
Spain*	P	P	P	P	P	P	P/P	P/P	P/P
Syria*	N	P	P	P	P	N	N/N	P/P	P/N
Tunisia*	P	P	P	P	P	N	P/N	P/N	P/P
Turkey*	N	P	N	N	P	N	N/N	P/N	N/N
United Kingdom	P	P	P	P	P	P	P/P	P/N	P/P

LOS: Law of the Sea Convention; MP: MARPOL with Annexes; LC/LCP: London Convention/with Protocol; OPRC/HNS: Oil Pollution Response Convention/Hazardous and Noxious Substances Protocol; INT/P: Intervention Convention/with Protocol

*: IUCN Member; N: Non-party; P: Party; S: Signatory non-party.

Appendix A is based on information stated as correct on 11.07.2008 on the UNDOALOS website and 30.06.2008 on the IMO website; last accessed 20.07.2008.

Appendix B. Mediterranean coastal State Parties to the Barcelona Convention and Protocols

	BC	BCA	DP	DPA	EP	NEP	SPA	SPB	OP	HWP
Albania	P	P	P	P	P	N	P	P	P	P
Algeria	P	P	P	N	P	S	P	S	N	S
Bosnia and Herzegovina	P	N	P	N	P	N	P	N	N	N
Croatia	P	P	P	P	P	P	P	P	S	N
Cyprus*	P	P	P	P	P	P	P	P	P	N
Egypt*	P	P	P	P	P	N	P	P	N	S
European Union	P	P	P	P	P	P	P	P	N	N
France*	P	P	P	P	P	P	P	P	N	N
Greece*	P	P	P	N	P	P	P	S	S	S
Israel	P	P	P	N	P	S	P	S	S	N
Italy*	P	P	P	P	P	S	P	P	S	S
Lebanon*	P	N	P	N	P	N	P	N	N	N
Libya*	P	N	P	N	P	S	P	S	N	S
Malta	P	P	P	P	P	P	P	P	S	P
Monaco*	P	P	P	P	P	P	P	P	S	S
Montenegro	N	P	N	N	N	P	N	P	N	P
Morocco*	P	P	P	P	P	S	P	S	P	P
Slovenia	P	P	P	P	P	P	P	P	S	N
Spain*	P	P	P	P	P	S	P	P	S	S
Syria*	P	P	P	N	P	S	P	P	S	N
Tunisia*	P	P	P	P	P	S	P	P	P	P
Turkey*	P	P	P	P	P	P	P	P	N	P
United Kingdom	N	N	N	N	N	N	N	N	N	N

BC: Barcelona Convention; BCA: Barcelona Convention Amendments; DP: Dumping Protocol; DPA: Dumping Protocol Amendments; EP: Emergency Protocol; NEP: New Emergency Protocol; SPA: Specially Protected Areas Protocol; SPAB: SPA and Biodiversity Protocol; OP: Offshore Protocol; HWP: Hazardous Wastes Protocol;

* : IUCN Member; N: Non-party; P: Party; S: Signatory non-party.

Appendix B is based on information stated as correct on 25.04.2008 on the BC website; last accessed 20.07.2008.

Chapter 2

A review of global experience with particularly sensitive sea areas (PSSAs)

Julian P. Roberts, Ph.D. & J. Siân H. Pullen, Ph.D.

Abbreviations and acronyms

AIS	Automatic identification system
APM	Associated protective measure
ATBA	Area to be avoided
CBD	Convention on Biological Diversity, 1992
COLREGS	International Regulations for the Prevention of Collisions at Sea, 1972
DOALOS	United Nations Division for Ocean Affairs and the Law of the Sea
EEZ	Exclusive economic zone
EU	European Union
FKNMS	Florida Keys National Marine Sanctuary
GBRMPA	Great Barrier Reef Marine Park Act, 1975
GPSR	General Provisions on Ships' Routeing
HELCOM	Helsinki Commission—Baltic Marine Environment Protection Commission
IMO	International Maritime Organization
MARPOL 73/78	International Convention for the Prevention of Pollution from Ships, as modified by the 1978 Protocol relating thereto
MEHRA	Marine environmental high risk area
MEPC	IMO Marine Environment Protection Committee
MPA	Marine protected area
MSA	Maritime Safety Authority of New Zealand
MSC	IMO Maritime Safety Committee
NAV	IMO Sub-committee on Safety of Navigation
NGO	Non-governmental organization
NOAA	National Oceanic and Atmospheric Administration (USA)
PSSA	Particularly sensitive sea area

SEA	Strategic environmental assessment
SOLAS	International Convention for the Safety of Life at Sea, 1974
SRS	Ship reporting system
TSS	Traffic separation scheme
UNCED	United Nations Conference on Environment and Development
UNCLOS	United Nations Convention on the Law of the Sea, 1982
USA	United States of America
VOS	Voluntary observing ship
VTS	Vessel traffic services
WE PSSA	Western European Particularly Sensitive Sea Area
WWF	formerly known as the World Wide Fund for Nature

1. Executive summary

In the context of marine environment protection and biodiversity conservation, a number of shipping management measures adopted by the International Maritime Organization (IMO) can be viewed as implementing obligations under international law of the sea. Pre-eminent among these measures is the particularly sensitive sea area (PSSA) designation: a management tool that can be applied in an integrated manner, irrespective of maritime jurisdictional boundaries to address real or potential impacts from international shipping activity. However, despite the potential benefits that may be realized by designation of an area as a PSSA, the application of the PSSA concept has been problematic, particularly in the early days and more recently during the last three years. Nevertheless, a number of examples clearly demonstrate the usefulness of the shipping management tool.

It must be clearly understood that designation of a PSSA does not automatically confer any particular shipping regulation or environmental protection on a sea area nor does it change the unilateral capacity of a coastal state to control and regulate the passage of ships through the area. The PSSA guidelines require the adoption by IMO of associated protective measures (APMs), such as ships' routeing measures, that address the vulnerability of the area to damage by international shipping activities. These measures, because they will result in a change to ships' operations, must have a legal basis. There is a clear need for any application for PSSA designation to establish that the identified vulnerability will be addressed by the proposed APM. Over the last 2–3 years, there have been a number of proposals considered by IMO where the link between the identified vulnerability and the proposed APM has been difficult to establish and this has undermined confidence in the PSSA concept.

It is clear from the PSSAs adopted to date that states are interpreting and applying the PSSA concept in different ways. In some cases states have clearly used the PSSA concept as

a decision support process to evaluate the specific threat posed by international shipping, thereby allowing them to narrowly tailor the most effective measures to address that threat. Others, however, appear to be designating areas as PSSAs more for their iconic status rather than for any demonstrated protection that can be derived from such designation. Moreover, recently there have been two cases where a concern was raised that states were attempting to use PSSA designation to support the adoption by IMO of measures that may interfere with navigational freedoms.

PSSA designation is not a precondition for the adoption of any APMs. This is particularly true for those APMs associated with existing PSSAs, each of which has a legal basis in an existing IMO instrument, or is recognised as a measure in its own right for the protection of a particular area. In fact, to date no PSSAs have been designated which include measures that could not otherwise have been adopted through an alternative process within IMO. Numerous states have implemented routeing and other protective measures for the purpose of environmental protection without going through the process and identifying and designating that area as a PSSA. States contemplating the development of a PSSA proposal should therefore give detailed consideration to the conservation benefits that will be realized by such a designation, rather than by the adoption and full implementation of the respective IMO measures.

In the context of the wider Mediterranean region, this report highlights a number of critical factors that have been relevant in previous PSSA proposals considered by IMO. If Mediterranean states are to consider designating parts of the Mediterranean as PSSAs, the following key findings may assist in their consideration and development of such proposals:

- a) Since PSSA designation does not provide any additional legal protection to the

application of existing IMO measures, the primary benefits that can be realized by PSSA designation are those non-legal, intrinsic benefits that result in the global recognition of an area as a PSSA. There are two aspects to the importance of raising awareness of the problem that the PSSA is designed to address:

- improving the chances of the PSSA proposal being adopted; and
 - improving the implementation and enforcement of the PSSA and its APMs.
- b) When states submitting PSSA proposals have made efforts to raise awareness of the threat(s) and the importance of new protective measures before the proposal has been considered, they have had greater success with their proposals in a shorter time. Experience within IMO illustrates that the more fully developed a proposal is before submission, and provided it does not raise a contentious issue, the greater the likelihood that it will follow a straightforward path through the intricacies of the IMO system.
- c) The idea that simply identifying an area on a chart as being particularly sensitive will change the behaviour of a ship's crew is too simplistic, since numerous factors must be taken into account when making operational decisions regarding navigation. Therefore, if PSSA proposals or other shipping management protective measures are to be successful once adopted by IMO Member States, it is essential that those on the ships recognise the threat and understand the need to follow the measures introduced. If ships' crews are not aware of the threat and do not understand the need for the protective measure(s), the purpose of the PSSA is undermined. Where such measures appear to have been most successful is where the designation has been accompanied by targeted campaigns to educate mariners of the special significance of the area, supported by comprehensive monitoring and enforcement.
- d) Regional support for a PSSA is essential, particularly if the PSSA spans the waters of a number of countries and/or covers major international shipping routes. If a PSSA is proposed for an enclosed sea area or within an enclosed sea area, such as the Mediterranean, experience has shown that it is essential to start by gaining the support of neighbouring countries.
- e) When states are considering how to publicize the threat to an area and the need for new management measures, local networks can be invaluable in building awareness and developing support. Local networks also frequently hold data that may be valuable for the development of a proposal. Use of local networks need not be restricted to environmental networks. In many regions industry-based networks also operate. It will be essential to consult and generate support from local shipping industry networks, particularly since these are likely to be the bodies responsible for abiding by new APMs established under a PSSA designation.
- f) Notwithstanding the benefits that may be realized by using the PSSA as a vehicle for educating mariners of the special significance of the area, arguably the most significant benefits that have been realized by identifying and designating a PSSA are those related to the process of evaluating the environmental vulnerability of an area and identifying the most appropriate measure(s) to prevent, reduce or eliminate that vulnerability.
- g) Risk assessment is a management tool which can be used to determine the combined sensitivity and vulnerability of an area. While a formal risk assessment is not a requirement of a PSSA proposal, it has been used successfully to support the case of a number of PSSAs, and has also been used nationally by Australia and the UK in the identification of Marine Environmental High Risk Areas within territorial waters. Mediterranean states should therefore consider undertaking a comprehensive risk assessment of all or parts of the Mediterranean region to assist

in the determination of whether PSSA designation is warranted.

- h) The application of the PSSA concept to wide geographic areas has provoked considerable discussion within IMO in recent years. In developing a PSSA proposal, proponents must be able to demonstrate that the size of the proposed area is commensurate with that necessary to address the identified need. It is therefore important to show that the boundary of the proposed PSSA accurately reflects the limits of the environmental vulnerability.
- i) Designation of an area as a PSSA should require a demonstrable link between the threat posed by shipping activities and the legal measures to protect the area. This approach has been clearly highlighted in a number of PSSA proposals to date. However, in other cases this link has been far from clear, resulting in protracted

debates in a number of IMO fora and an overwhelming demand for a review of the basis for the designation of PSSAs.

- j) During the past 2–3 years, it has been difficult to ascertain from some PSSA applications submitted whether proposed APMs fulfil the requirements of the pertinent legal instrument establishing them. Moreover, it is clear from the discussions at IMO over the past two years that there exists a divergence of opinion on interpretation of the provisions of UNCLOS, insofar as it relates to the legal basis for measures to protect a PSSA. IMO appears to have taken the position that any proposed measure must have a clear legal basis in an existing IMO instrument, or it must at least be demonstrated how such a legal basis is to be established. Hence any future proposals for PSSA designation must include a proposal for an APM, including a clear analysis of the basis of that measure under international law.

2. Introduction

Despite the development of a number of global regulations, international shipping remains a significant contributor to contamination and damage of the marine environment and its biodiversity. As ship traffic increases, and the environmental risks⁴⁸ increase commensurately, coastal states are demanding better mechanisms to protect their resources and their biodiversity. Yet, historically, states have largely failed to regulate navigation for environmental purposes, particularly since there are often strong objections to the placing of prohibitions or restrictions on navigation, on the grounds that these run counter to the freedom of navigation enshrined in international law (De Klemm, 1993). The historical debate over the regulation of shipping for environmental purposes is characterized by two dichotomous views—those that wish to see the adoption of ever more stringent regulations for the protection of coastal states' marine resources and biodiversity, and those that view coastal states' environmental regulation as a threat to traditional rights of freedom of navigation and therefore wish to limit the regulation of navigation for environmental purposes (Bodansky, 1991). The development, over the past 50 years, of international law relating to vessel-source pollution specifically and the law of the sea generally has sought to resolve this conflict by defining more precisely the jurisdictional rights and responsibilities of states (Bodansky, 1991). Thus the current international legal framework, codified in the 1982 United Nations Convention on the Law of the Sea (UNCLOS), the International Convention for the Prevention of Pollution from Ships 1973 as modified by the Protocol of 1978 relating thereto (MARPOL 73/78) and the International Convention for the Protection of the Safety of Life at Sea (SOLAS), provides varying

levels of protection to coastal states depending on the maritime zones within which the protective measures are applied, as well as defining more clearly the obligations on maritime and flag states to protect the marine environment.

The International Maritime Organization (IMO) is firmly established as the pre-eminent organization for the regulation of all aspects of maritime shipping activities (e.g. Birnie, 1997; Blanco-Bazán, 2003).⁴⁹ The development of a comprehensive regulatory regime for the prevention and control of marine pollution has established IMO at the forefront of global efforts to protect the marine environment. Furthermore, despite the focus on marine pollution, since the conclusion of the 1992 United Nations Conference on the Environment and Development (UNCED), the coastal state members of IMO have required a broader view of marine environmental protection and many IMO instruments now address wider issues of marine biodiversity conservation and habitat protection. Notable examples include amendments to SOLAS to explicitly provide for the adoption of navigation control measures for the purpose of environmental protection (Roberts, 2005); developments in the control and management of invasive species; and the phasing out of harmful antifouling compounds. Among the measures that IMO has adopted to manage the impacts of shipping on the marine environment, the particularly sensitive sea area (PSSA) concept stands out as a unique management tool that can be applied in an integrated manner, irrespective of maritime jurisdictional boundaries (Raaymakers, 2003).

While it is generally acknowledged that IMO instruments give effect to obligations under UNCLOS (see LEG/MISC/3/Rev.1, 2003), it is

48 The main impacts from shipping include oil and chemical spills and discharges, physical damage to habitats such as reefs, ship strikes of large marine animals such as whales and sharks, leaching of antifouling paints, ballast water discharges, disposal of garbage, loss of packaged dangerous goods, discharges of sewage, and emissions into the air of a variety of substances, including carbon dioxide, SO_x and NO_x. New evidence is emerging that ships' noise is also a major contributor to disturbance of wildlife in the oceans. These impacts are discussed in the companion volume to this one (Abdulla & Linden, In press).

49 The relationship between IMO and UNCLOS is discussed in detail in IMO document LEG/MISC/3/Rev.1 (2003).

also now widely accepted that many of IMO's environmental instruments may give effect to obligations under other international biodiversity conservation instruments, such as the 1992 Convention on Biological Diversity (CBD). During the past 12 years, coastal states have increasingly sought to apply navigation measures for environmental purposes (Roberts, 2005). IMO and its members are therefore increasingly being called upon to make difficult decisions

relating to the regulation of maritime activities for the purpose of marine environment protection. In this regard, the PSSA concept is viewed by many observers as a tool with considerable utility to enable states to give effect to obligations under UNCLOS and CBD (as well as many of the outcomes from UNCED and the 2002 World Summit on Sustainable Development), while ensuring the delicate jurisdictional balance of UNCLOS remains intact.

3. PSSA overview

3.1 The PSSA concept

In its original form, the primary purpose of the PSSA concept was simply to assemble and analyse opportunities offered by certain IMO conventions to provide extra protection to already existing marine protected areas (MPAs), especially those beyond the territorial sea (Gjerde & Ong, 1993). However, more recently the PSSA concept has assumed an important status as a protective measure in its own right, for providing protection to MPAs and other environmentally sensitive marine areas from the impacts of shipping. As a result, coastal states are increasingly seeking to apply the PSSA concept as a primary measure to regulate international shipping in environmentally sensitive areas.

The ability of IMO to designate a PSSA is provided through IMO Assembly Resolution A.982(24) (the 2005 PSSA Guidelines; see section 9.2, Official Documents). The 2005 Resolution supersedes and updates three previous Resolutions A.720(17) (1991), A.885(21) (1999) and A.927(22) (2001). A PSSA is defined as:

An area that needs special protection through action by IMO because of its significance for recognised ecological, socio-economic, or scientific attributes where such attributes may be vulnerable to damage by international shipping activities.

In general, for an area to be identified as a PSSA, three elements must be present (Roberts *et al.*, 2005):

- a) The area must meet at least one of three given criteria (ecological; social, cultural and economic; or scientific and educational);
- b) It must be vulnerable to damage by international shipping activities; and
- c) There must be measures that can be adopted by IMO to provide protection to

the area from these specifically identified international shipping activities.

De La Fayette and others (Kelleher *et al.*, 1995; Agardy, 1997; de La Fayette, 2001) argue that a PSSA may be regarded as a kind of specialized MPA, or may be designated in conjunction with a MPA regulating non-shipping activities, in order to protect an ecologically sensitive area of the sea from the hazards of international shipping. There is wide recognition that the PSSA concept can be applied as one means of addressing states' obligations under the CBD (e.g. de Fontaubert *et al.*, 1996; de La Fayette, 2001; OSPAR Document ICG-MPA 05/8/1-E, 2005, p.5). In this regard, it should be noted that the PSSA concept is a problem-oriented mechanism to enable the adoption of measures to protect against damage from international shipping, and not from other ocean uses. Other threats to the same areas are covered by other regimes (Chircop, 2005).

3.2. Benefits of PSSA status

It is widely argued that the designation of a PSSA has an intrinsic value in itself, since it serves to highlight that an area is sensitive and that mariners should exhibit greater caution than might otherwise be the case (e.g. MEPC 36/21/1, 1994). Designation of the Great Barrier Reef as a PSSA appears to have had this effect, as it has focused both national and international measures to protect the area from ship-related and other impacts. The PSSA has been of value *per se* as it has raised the profile of the area as an environmentally sensitive area requiring special measures of protection (Paul Nelson (Australian Maritime Safety Authority), personal communication to JR). Alternatively, others argue that if measures to regulate shipping are not adopted, or only those measures that already exist in an IMO instrument are applied, there is no benefit to be gained from designation as a PSSA. Notwithstanding these arguments, it is accepted by many observers that PSSA designation does offer a number of benefits (Gjerde & Pullen, 1998):

- a) The PSSA concept represents a comprehensive management tool at the international level that provides a mechanism for reviewing an area that is vulnerable to damage by international shipping and determining the most appropriate way to address that vulnerability.

In this regard, the application of the PSSA concept as a management tool exhibits many similarities to risk assessment tools used to identify areas of high risk and to select appropriate mitigation measures to treat that risk. In the context of PSSAs the 'risk' is environmental damage;

- b) Designation of an area as a PSSA provides global recognition of the special significance of a designated area within the international maritime community;
- c) Designation of an area as a PSSA may inform mariners of the importance of taking extra care when navigating through a region; and
- d) Designation of an area as a PSSA gives coastal states the opportunity to adopt additional protective measures to address the particular risks associated with international shipping in the area.

3.3. Legal basis for PSSAs

In the context of UNCLOS, the power to create PSSAs to protect the marine environment may be derived from the general provisions found throughout UNCLOS relating to the protection of the marine environment and specifically rare and fragile ecosystems (de La Fayette, 2001). The designation of a PSSA may also be considered to be giving effect to obligations that require states, acting through the competent international organization, to establish rules and standards to prevent pollution from vessels and to adopt routing measures to minimize the risk of accidents resulting in pollution. There is also a number of other treaties designed to protect

the marine environment that support the PSSA concept. However, it must be recognised that the designation by IMO of a PSSA, in and of itself, has no legal significance because the concept is created by a non-binding IMO Assembly resolution and is not set forth in a convention. The PSSA Guidelines require the adoption by IMO of 'associated protective measures' (APMs), such as ships' routing measures, to address the vulnerability of the area to damage by international shipping activities. These measures, because they are designed to change ships' operations, must have a legal basis (Roberts *et al.*, 2005).

UNCLOS provides for specific actions that can be taken by individual coastal states to regulate the navigation of foreign vessels through their territorial seas, as well as measures that may be adopted by IMO to enable states to regulate the navigation of foreign vessels in their EEZ. The PSSA Guidelines recognise these actions and set forth three possible legal bases for an APM:

- a) any measure that is already available under an existing IMO instrument; or
- b) any measure that does not yet exist but could become available through amendment of an IMO instrument or adoption of a new IMO instrument. The legal basis for any such measure would only be available after the IMO instrument was amended or adopted, as appropriate; or
- c) any measure proposed for adoption in the territorial sea, or pursuant to Article 211(6) of UNCLOS, where existing measures or a generally applicable measure (as set forth in (b) above) would not adequately address the particularized need of the proposed area.

It should therefore be understood that, in itself, designation of a PSSA confers no direct regulatory benefit. It is only through the application of APMs, such as ships' routing measures, that the legal basis for the regulation of shipping can be provided.

4. Historical development of the PSSA concept

The concept of the PSSA was first introduced into the IMO agenda at the Tanker Safety and Pollution Prevention Conference convened in February 1978 (Peet, 1994). Resolution 9, adopted at the Conference, *inter alia* invited IMO to initiate studies with a view to:

- a) Making an inventory of sea areas around the world which are in special need of protection against marine pollution from ships and dumping, on account of the areas' particular sensitivity in respect of their renewable resources or in respect of their importance for scientific purposes; and
- b) Assessing as far as possible the extent of the need for protection, as well as the measures which might be considered appropriate to achieve a reasonable degree of protection, taking into account also other legitimate uses of the seas.

Little progress was made until 1990, when Australia submitted a proposal to IMO seeking to identify the Great Barrier Reef as a PSSA, and to adopt a system of compulsory pilotage for its protection. As a result, in 1991, IMO finally adopted Resolution A.720(17), which contained the Guidelines for the Designation of Special Areas and the Identification of Particularly Sensitive Sea Areas (the 1991 Guidelines). While the PSSA concept received international support, the 1991 Guidelines were criticised for being too complicated and for confusing the concept of PSSAs with Special Areas designated under MARPOL 73/78 (Peet, 1994). Several environmental NGOs suggested revising the 1991 Guidelines with a view to simplifying them and separating them into two documents: one to address Special Areas and one to address PSSAs.

In September 1997, the IMO Marine Environment Protection Committee (MEPC) officially recognised the second PSSA—the Sabana-Camagüey archipelago, off the coast of Cuba. While the

proposal clearly identified how the archipelago met the criteria for PSSA identification, it failed to discuss the level of traffic in the region or, more importantly, what measures Cuba proposed to take to address the vulnerability to shipping in the area (Gjerde & Pullen, 1998). Cuba reserved the right to decide at a later stage what additional measures were necessary, and thus introduced the concept of 'approval in principle' to the PSSA process, which had not been considered previously. It also precipitated the submission of a paper by the United States of America (USA) seeking an amendment to clarify procedures. The USA's proposals were, by and large, adopted in a revised Assembly Resolution (A.885(21), 1999), which set out more clearly the steps necessary to implement the 1991 Guidelines and, for the first time, articulated a legal basis for the APMs to be adopted in respect of a PSSA.

In the meantime a more comprehensive revision of the entire guidelines was being undertaken, and in 2001 MEPC adopted a third resolution (Assembly Resolution A.927(22), 2001) creating two separate sets of Guidelines, one for Special Areas (Annex 1) and one for PSSAs (Annex 2). These 2001 Guidelines included more rigorous evidentiary and procedural requirements as well as new and updated criteria to reflect current priorities in international instruments, such as the CBD (Gjerde, 2001). The required link to risk from international shipping activities was clearly emphasised and, building on the amendments that had been adopted in Resolution A.885(21), the 2001 Guidelines articulated the need for a clear legal basis for protective measures.

Since the adoption of the 2001 Guidelines, nine PSSA proposals have been designated by MEPC. As a result of increasing concerns over the manner in which the PSSA Guidelines were being interpreted and applied, in particular in response to major incidents such as the *Prestige* and *Erika*, several member states, supported by industry NGOs, called for a further revision of the PSSA Guidelines, which they considered too broad

and vague in their wording and open to different and liberal interpretations (Frank, 2005). Pending completion of such a revision, a moratorium was sought on the designation of further PSSAs. While MEPC resisted calls for a moratorium, the Committee did approve the possibility of reviewing the PSSA Guidelines, based on specific proposals to be submitted. In October 2004, MEPC considered three submissions from the USA, the Russian Federation and the shipping

industry and agreed to establish a Correspondence Group to undertake a further review of the PSSA Guidelines, with the objective of clarifying and where appropriate, strengthening the existing Guidelines. At its 24th session in December 2005, the IMO Assembly finally adopted the revised Guidelines (the 2005 Guidelines: Assembly Resolution A.982(24), 2005), which address a number of substantive issues identified by the various submissions to MEPC.

5. Designation process

The PSSA Guidelines make it clear that only IMO Member States can submit proposals for the identification of a PSSA and that IMO is recognised as the only international body with competence for designating areas as PSSAs and adopting APMs for their protection. Where appropriate, IMO may consider joint proposals from multiple states bordering an area proposed as a PSSA. Any application for a PSSA must contain three parts:

- a) A summary of the objectives of the proposed PSSA identification, its location, the need for protection and proposal of APMs;
- b) A detailed description of the area, together with a chart, an explanation of the significance of the area based on the recognised criteria, and an explanation of the vulnerability of the area to damage from international shipping activities, noting the factors regarding maritime activities listed in the criteria; and
- c) A description of the proposed measures, showing how they will provide the needed protection from the identified threats of shipping damage.

IMO has published a guidance document detailing the submission process for those states wishing to submit proposals for PSSA identification (IMO Circular MEPC/Circ.398, 2003). While this guidance document is still very useful, it should be noted that it has not been updated to take account of the recent changes to the PSSA Guidelines effected by the adoption of Resolution A.982(24).

The PSSA Guidelines make it clear that identification of a PSSA and its protection with legal measures are two separate but related matters. As such, it is clear from the Guidelines that what is sought by MEPC is a logical analysis that achieves the following:

- a) Clear establishment of the values that are vulnerable within the area in question;
- b) Clear demonstration of the international shipping activities that threaten those values; and
- c) Identification of specific measures that can clearly be demonstrated to reduce the threat presented by those maritime activities. Thus, the proposal must not only identify the proposed APMs, but also demonstrate how these provide the needed protection from the identified threat.

In other words, there must be a clear and demonstrable link between the threat to the marine environment and the measures proposed to mitigate that threat (Roberts *et al.*, 2005). It therefore logically follows that demonstrating that an area meets the criteria for identification of a PSSA, and providing that area with appropriate legal protection, must be considered part of the process of designating a PSSA. These two critical elements will therefore be discussed in more detail below.

5.1. PSSA identification

For an area to be identified as particularly sensitive, it must be both of special significance and threatened by international shipping activities (i.e. vulnerable).

5.1.1. Significance of the area

By definition, a PSSA must be significant from an environmental, socio-economic or scientific perspective. Thus, in order to be identified as a PSSA the area should meet at least one of the criteria set forth in Section 4 of the PSSA Guidelines (section 4 criteria). The range of criteria is broad (see Table 2.1) and it is arguable whether any but the most degraded marine area could fail to meet at least one of the criteria listed. Indeed, the fact

that only one of the criteria need be represented in the area has been criticised on more than one occasion, on the basis that it might give rise to a risk of proliferation of PSSAs (e.g. MEPC 33/INF.27, 1992; Chircop, 2005). It appears to be accepted that unless at least one of the criteria is present throughout the entire area, then that area cannot be considered to be particularly sensitive throughout; however it need not be the same criterion throughout the whole area. The PSSA Guidelines provide very little guidance on the interpretation of these criteria, but simply provide a brief definition for each one.

5.1.2. Vulnerability to international shipping

Any proposal for a PSSA should demonstrate the nature and extent of the risk that international shipping activities pose to the environment of the proposed area. Relevant factors might include vessel traffic characteristics in the area (operational factors, vessel types, traffic characteristics and harmful substances carried) and natural factors (hydrographic, meteorological and oceanographic). An explanation of the actual or potential damage to the area resulting from international maritime activities may be added, as well as details of the particular ongoing or future activities that are causing or may cause the damage. Examples of such information include whether the damage is recurring or cumulative in nature, any history of grounding, collisions or spills and the consequences of such incidents, as well as stresses from other

environmental factors such as land-based sources of pollution.

The 2005 Guidelines reinforce the need to clearly demonstrate how the area is vulnerable to damage from international shipping activities. This linkage is crucial if the PSSA concept is to retain credibility as a tool. However, concerns have been raised that by strengthening this requirement, the precautionary benefits of PSSA designation may somehow be diminished. It has been argued that, in some cases, it is hard to define a threat until after the damage has occurred. However, a number of factors can provide an indication of a threat without actually demonstrating that damage has occurred. A good example is provided by the joint submission by Australia and Papua New Guinea in support of the case for an extension of the Great Barrier Reef PSSA to include the waters of Torres Strait (MEPC 49/8, 2003). These states argued that the increasing number of ships, and the increasing carriage of harmful substances, coupled with the decline in the uptake of pilotage services, posed a significant threat to the waters of Torres Strait. These arguments were widely accepted by MEPC although no specific incidents were cited.

5.2. Protection of PSSAs

Any application for PSSA designation is expected to identify legal measures that address the risk posed to the area by international shipping activities. The PSSA Guidelines provide for

Table 2.1 – Criteria for the identification of a PSSA

Ecological	Social, Cultural and Economic	Scientific and Educational
Uniqueness or rarity	Social or economic dependency	Research
Critical habitat	Human dependency	Baseline for monitoring studies
Dependency	Cultural heritage	Education
Representativeness		
Diversity		
Productivity		
Spawning or breeding grounds		
Naturalness		
Integrity		
Fragility		
Biogeographic importance		

the application of existing APMs where it can be demonstrated that an area is adequately protected by these measures. The PSSA Guidelines make it explicit that the purpose of the APMs is to 'prevent, reduce, or eliminate the identified vulnerability'. Therefore, there is a clear need for the application to demonstrate that the identified vulnerability will be addressed by the proposed APMs. Over the last 2–3 years, there have been a number of proposals considered by MEPC where this linkage has been difficult to establish. In particular, both the Western European PSSA (Roberts *et al.*, 2005) and the Baltic Sea PSSA (Roberts, 2006a) (discussed in section 6, *below*) suffered from a lack of clarity as to how the proposed APMs would address the most significant threats to the respective regions.

The adoption of protective measures is left to be determined by IMO and its subsidiary bodies, within the general categories of rules, standards and navigational practices designed to prevent pollution. Specific measures adopted by IMO to date include ships' routing measures and ship reporting systems under SOLAS, Special Areas under MARPOL 73/78, and a range of specific measures adopted through IMO resolutions (see the following chapter in this volume: Roberts, *in press*). Where measures are adopted under these relevant instruments, states have already agreed implicitly that such measures do not unreasonably impede freedom of navigation. On the other hand, where there is no provision in any existing instrument for a specific measure, and where that measure may be used, for example, as a basis for prohibiting entry into a specific area, then the prohibition may impact upon the principle of freedom of navigation.

In addition to those measures that have previously been adopted in association with PSSAs, the IMO Secretariat has prepared a summary of the types of measures that may be applicable for adoption as APMs (MEPC 46/6/1, 2001). However, at this stage most of those APMs identified remain untested and it is clear from previous experience within IMO that maritime states are uncomfortable when it comes to the adoption of new measures. The limits of what may be adopted by IMO as an APM are not clearly defined in the PSSA Guidelines, although

conformity with UNCLOS appears to be a prerequisite. The PSSA Guidelines require that the impact on navigation of a proposed APM be considered. In an analysis undertaken by the United Nations Division for Ocean Affairs and the Law of the Sea (DOALOS), it was accepted that an APM that would violate the principle of freedom of navigation would not be acceptable. However, it was also considered that any measure accepted by the IMO Sub-committee on Safety of Navigation (NAV) as being in conformity with IMO requirements would be *de facto* in conformity with UNCLOS, as UNCLOS 'defers to IMO on navigational rules, regulations and standards' (LEG 87/WP.3, 2003).

It is clear from the discussions at IMO over the past two years, that there exists a divergence of opinion on the interpretation of UNCLOS provisions insofar as they relate to the legal basis for measures to protect a PSSA. Some observers argue that IMO has legal competence to adopt APMs based on the general provisions of UNCLOS and on the authority conferred upon IMO by UNCLOS. They also argue that, in addition to UNCLOS, other sources of international law may provide a legal basis for IMO to take specific action. Others argue that IMO cannot adopt specific measures that affect ships' operations based only on a general grant of authority under UNCLOS or other rules of international law. A flag state must have certainty with regard to the laws affecting its ships and thus the law must be clear and unambiguous. Many therefore consider that, while UNCLOS provides IMO with a general mandate to take certain action such as the adoption of rules and standards, there are only a few places where its language addresses the adoption of specific types of measures by IMO or coastal states.

This position has consistently been challenged by environmental NGOs and some member states, who believe that such a restrictive view presupposes that IMO has no legal competence to adopt measures based on the general provisions of UNCLOS and on the authority conferred on IMO by the general provisions of UNCLOS, other rules of international law, and customary international law. However, for the time being, IMO appears to have rejected this argument in favour of a more restrictive

interpretation. Thus, the 2005 PSSA Guidelines make it clear that, for an APM to be approved, there must be an existing IMO instrument to give legal effect to the APM. In the future it will be incumbent upon the applicant to clearly demonstrate that a legal basis exists or, in the

event that a legal basis does not exist, what steps they intend to take to establish one for a specific APM. This does not, however, prevent IMO from developing further instruments in the future on the basis of consensus agreement by its members.

6. International experience with the PSSA concept

To date 11 proposals for PSSA designation have been considered and adopted by IMO. These, together with the APMs adopted in each case, are summarized in Table 2.2.

Table 2.2—PSSAs designated to date

PSSA	Designation	Associated Protective Measures
Great Barrier Reef, Australia	1991	Compulsory pilotage
		IMO-recommended pilotage
		Mandatory reporting
Sabana-Camagüey Archipelago, Cuba	1998	Traffic separation schemes
		Area to be avoided
		Discharge prohibitions
Malpelo Islands, Colombia	2002	Area to be avoided
Florida Keys, USA	2002	Four areas to be avoided
		Three mandatory no-anchoring areas
Wadden Sea, North Sea	2002	Mandatory reporting*
		Routeing systems*
		MARPOL special areas*
Paracas National Reserve, Peru	2003	Area to be avoided
Western Europe	2004	Fourteen traffic-separation schemes*
		Two deepwater routes*
		Seven areas to be avoided*
		Mandatory 48-hour reporting for single-hull tankers carrying heavy grades of fuel oil
Torres Strait, Australia	2005	Compulsory pilotage
		Recommended two-way route
Canary Islands, Spain	2005	Five areas to be avoided
		Recommended tracks
		Mandatory ship reporting
Galapagos Islands, Ecuador	2005	Area to be avoided
Baltic Sea	2005	MARPOL Special Area*
		Mandatory reporting*
		Transit route*
		Deepwater route*
		Fifteen traffic-separation schemes*
		Localized compulsory pilotage*
		Deepwater route
Two areas to be avoided		

* Existing measure prior to designation as a PSSA

It is clear from this summary that, despite its emergence in 1992, uptake of the PSSA concept was initially slow. As a result, most experience with the concept has only been gained over the past five years and in most cases the PSSAs have not been established long enough for a comprehensive assessment of their effectiveness to be undertaken. In order to review international experience with the PSSA concept therefore, it is useful to consider to what extent the various benefits proposed for PSSA designation have been realized with those PSSAs adopted to date.

6.1. Adoption of additional measures

One of the primary benefits suggested for PSSA designation is that it gives coastal states the opportunity to adopt additional protective measures to address the particular risks associated with international shipping in the area.

The examples of the Florida Keys and Great Barrier Reef PSSAs illustrate how a state may work through IMO to develop new measures for specific purposes to provide additional protection for a PSSA.

6.1.1. Case study 1: Florida Keys National Marine Sanctuary no-anchoring regulation

The Florida Keys were designated a National Marine Sanctuary (FKNMS) under domestic legislation in 1990 (Morin, 2001), in recognition of the uniqueness, significance and diversity of the regional ecosystem. The region has one of the most heavily trafficked sea lanes in the world, which in combination with the physical hazard posed by the reef itself makes the area extremely vulnerable to the impact of shipping. As a result, a number of measures have been put in place to protect the area. Notable among these are the establishment of a series of areas to be avoided (ATBAs), implemented at the same time as the FKNMS was established. These ATBAs were codified into US domestic legislation in the Florida Keys National Marine Sanctuary and Protection Act of 1990. Thus the ATBAs provide one of the primary regulatory measures for the protection of the sanctuary. It is reported that the designation of the ATBAs has resulted in a significant decrease in the number of major ship groundings on the coral reefs. Prior to 1990 there was a major ship grounding involving vessels greater than 50m

in length nearly every year, while only two have occurred since the creation of the ATBAs (Bill Causey (NOAA), personal communication). In addition, recognising the significant damage that had been caused by anchoring in these unique areas, in 1997 the USA promulgated a sanctuary regulation prohibiting the destruction of coral by anchoring. However, despite wide publication of this regulation, ships continued to violate this no-anchoring regulation.

The Florida Keys region was designated a PSSA in 2002, following submission of a proposal by the USA. In undertaking its assessment for the proposed PSSA, the USA clearly identified that the primary purpose of the PSSA was to protect the unique coral reef tract and its related ecosystem from potential threats from international shipping activities (MEPC 46/6/2, 2001). In their analysis, the USA identified those areas that were most at risk from international shipping as well as the potential vulnerabilities of those areas. Particular attention was focused on the Tortugas Ecological Reserve and the Tortugas Bank, the two areas being of particular ecological significance even within the context of the FKNMS. Damage to these areas by anchoring has been widely documented (e.g. Hudson & Goodwin, 2001; Precht *et al.*, 2001; Tilmant *et al.*, 2004) and it was therefore considered that the adoption of no-anchor areas in the vicinity of these two specific areas would significantly contribute to their overall level of protection. Accordingly, the USA submitted a detailed proposal to the 47th session of the NAV Sub-committee for the establishment of two no-anchoring areas in the Tortugas Ecological Reserve and the Tortugas Bank in the Florida Keys. It was noted that the establishment of these areas would constitute one of the APMs to protect the area proposed for PSSA designation.

Before the USA had considered this PSSA proposal, the concept of a no-anchor area did not exist as an IMO-approved ships' routing measure. One of the important aspects of the US process was therefore the establishment of a new measure aimed at protecting the specific identified vulnerability of the PSSA. Prior to the submission of the PSSA proposal to MEPC, the USA sought an amendment to the General Provisions on Ships' Routing (GPSR) to provide for the recognition of no-anchoring areas as a recognised ships' routing measure. While the

GPSR recognised that anchoring should be one of the considerations in the planning of routing measures, no explicit measure aimed at anchoring was yet provided. Accordingly, the USA proposed that such areas could be established 'where anchoring may be unsafe, unstable, hazardous, or where there is the possibility that unacceptable damage to the marine environment could result' (NAV 46/3/2 (2000), emphasis added).

While the application for the amendment was made in advance of the submission of the PSSA proposal, it was the process of evaluating the PSSA that identified the need for such a measure in the first place. Thus, at the time of the submission of the PSSA proposal itself, the USA was able to clearly demonstrate that it had identified those areas at greatest risk from shipping (as well as the risks themselves) and that it was proposing the adoption of specific legal measures narrowly focused on addressing the specific vulnerability identified.

6.1.2. Case study 2: Great Barrier Reef compulsory pilotage

As a result of Australia's concerns over the potential for vessel-source pollution damage to the environment of the Great Barrier Reef, in 1987 IMO adopted a resolution recommending that all vessels carry a pilot when navigating the inner route of the Great Barrier Reef. Despite this measure, concerns remained about the risk posed by ships transiting the area without a pilot. Accordingly, the Australian Government sought international consensus and endorsement from IMO for a compulsory pilotage regime. In 1990 Australia requested of IMO that the Great Barrier Reef be identified as a PSSA (MEPC 30/19/4, 1990; Ottesen *et al.*, 1994). Australia's proposals with respect to the Great Barrier Reef resulted in the adoption of two resolutions (Peet, 1994): the first recognising the Great Barrier Reef as a PSSA, and the second 'recommending Member States to recognise the need for effective protection of the Great Barrier Reef region and to inform ships flying their flags to comply with the system of pilotage introduced by Australia' (Ottesen *et al.*, 1994).

Based on these resolutions, in October 1991 the Australian Government created compulsory pilotage areas for the inner route between Cairns and Cape York and in Hydrographers Passage (White, 2000), through an amendment to the Great Barrier Reef Marine Park Act, 1975 (GBRMPA).⁵⁰ Under this legislation, all ships 70 metres in length and over, and all loaded oil tankers, chemical carriers and liquefied gas carriers, irrespective of size, are required to carry pilots when navigating the hazardous northern part of the Reef and Hydrographers Passage. Chadwick and Storrie (2001) argue that the designation provides a strong moral and diplomatic base for implementation through IMO and has assisted with the introduction of both the pilotage regime and the mandatory vessel reporting system known as REEFREP. This system is considered by some to be the most effective management mechanism for both the Torres Strait and the inner route of the Great Barrier Reef (Chadwick *et al.*, 2004).

It should be noted that, while it is a generally held view that the Great Barrier Reef pilotage regime is considered to be an IMO-approved compulsory pilotage regime, nowhere in the relevant IMO resolution does it explicitly refer to compulsory pilotage. The 1990 Resolution simply recommends Member States to inform ships flying their flags to 'act in accordance with Australia's system of pilotage ...'. The compulsion relating to pilotage is brought about through the relevant provisions of the GBRMPA (White, 2000). The legislation set forth in the GBRMPA must therefore be read in the context of the relevant IMO recommendations, which provide international endorsement for the regime (Spadi, 2000). It should further be noted that although Australia has been successful in having compulsory pilotage accepted for the inner route, this route lies entirely within Australian internal and territorial waters (Macdonald, 1996).

6.1.3. Observations

While it is only necessary to introduce one APM, it is also considered that there is greater intrinsic

⁵⁰ The Great Barrier Reef Marine Park Act (1975), Part VIIA, sections 59A to 59M, entitled 'Compulsory Pilotage'. Section 59A defines the purpose of the Part as 'to impose a scheme of compulsory pilotage on regulated ships within the compulsory pilotage area of the Great Barrier Reef Region'.

value in the PSSA designation when utilized as an umbrella for introducing a number of APMs which together address specific risks or threats. Not only does this convey a measured approach to mitigating risks or threats (as opposed to a piecemeal approach), it also suggests, not always appropriately, that the solution to the identified problem is forthcoming, will be implemented and enforced, and that the consequence will be safer navigation and improved environmental protection.

While the two examples above illustrate situations where measures to protect the marine environment have been implemented as part of the process of designating a PSSA, it must be recognised that PSSA designation is not a precondition for the adoption of any APMs. This is particularly true for existing APMs that are associated with PSSAs, each of which has a legal basis in an existing IMO instrument or is recognised as a measure in its own right for the protection of a particular area. For example, while the Great Barrier Reef is often cited as an example of where PSSA designation provided for the implementation of a compulsory pilotage regime, pilotage regimes have been adopted in numerous places around the world without the need for PSSA designation to provide a justification. Therefore, this benefit is more a perception than a reality, since the designation of a PSSA does not alter the jurisdictional rights and obligations of a coastal state to control and regulate the passage of ships through the area. In fact, to date no PSSAs have been designated which include measures that could not otherwise have been adopted through an alternative process within IMO.

6.2. Adoption of Exceptional Measures

The second suggested benefit of PSSA designation is that it may allow for the adoption of exceptional measures that, while warranted, may not be able to find a specific legal basis in an existing instrument. In a number of examples, as described below, extraordinary or more stringent measures than would normally be applied have been put forward as part of PSSA proposals. In most cases IMO has not accepted the measures as legitimate ways to provide protection to the PSSA.

6.2.1. Case study 3: Torres Strait compulsory pilotage

The Torres Strait is situated between the Cape York Peninsula, at the northernmost point of Australia, and the island of Papua New Guinea. The region is recognised as an area of high marine biodiversity and outstanding conservation significance and is populated by indigenous peoples who have always had an intimate relationship with the sea and its resources. The Torres Strait was recognised as an international strait even before the development of UNCLOS.

Australia and Papua New Guinea had for some time been concerned at the risk posed by the increasing number of ships carrying hazardous substances and the decline in the uptake of pilots in the area. A 1995 study on shipping in the Great Barrier Reef and Torres Strait found that whether ships were piloted or not was one of the key factors in collisions and groundings in the waters of the region (Chadwick *et al.*, 2004). Furthermore, research undertaken on behalf of Australia suggests that compulsory pilotage could reduce the risk of groundings by between 45 and 57 percent and collisions by 57 to 67 percent, depending on the specific location within the Torres Strait.

In response to these concerns, Australia and Papua New Guinea submitted a joint proposal seeking an extension to the existing Great Barrier Reef PSSA to include the waters of the Torres Strait. Two APMs were suggested in the application:

- a) An amendment to the existing charting measure in the waters of the Great North East Channel to a two-way route through Torres Strait; and
- b) The extension of the compulsory pilotage regime currently applicable in the Great Barrier Reef to apply to vessels when navigating the Torres Strait and the Great North East Channel.

While it was generally agreed that the proposed compulsory pilotage scheme was operationally feasible and largely proportionate to provide protection to the marine environment, concerns

were raised by a number of member states with regard to the legal basis of establishing a compulsory pilotage regime in a strait used for international navigation. Many states considered that such a measure was an impediment to the international right of transit passage and that making pilotage compulsory implied the intention to impose some form of sanctions on those vessels that did not take on a licensed pilot (Roberts, 2006b). More specific concerns were also raised as to the competence of IMO to consider proposals for compulsory pilotage in international straits and whether any of the IMO instruments provided a satisfactory legal basis for such a measure to be adopted.⁵¹

As noted above, the compulsion as to pilotage within the Great Barrier Reef PSSA area is brought about through the relevant provisions of the GBRMPA. Since compulsory pilotage applies only within the territorial sea of Australia, and since IMO has adopted a resolution concerning this measure, the establishment of such navigation controls aimed at environmental protection appears wholly consistent with the provisions of UNCLOS. UNCLOS recognises that coastal states have a legitimate right to control certain aspects of navigation that directly relate to the protection and preservation of both the marine and adjacent coastal environments. However, such powers available to a coastal state do not extend to straits used for international navigation. IMO seems to have accepted this premise and, despite the obvious environmental vulnerability of the area and the risk posed by international traffic, failed to endorse a system of compulsory pilotage. Instead, it adopted a new resolution along the same lines as that adopted in 1991 for pilotage in the Great Barrier Reef.

A number of states expressed the view that support for adoption of the resolution was conditional on the measure being recommendatory only—as set forth in the resolution. More importantly, it was clearly noted by some states that the proposed resolution did not provide an international legal basis for mandatory pilotage for ships in transit in the Torres Strait or in any other strait used for

international navigation. Moreover, these states made it clear that if the IMO Committee took an alternative view, that they would not be able to support the resolution. Thus, the lack of a specific reference to ‘compulsory pilotage,’ and a general acceptance of the recommendatory nature of the resolution, seems to have satisfied the majority of those states that opposed the proposal. As such, IMO has only endorsed a system of voluntary pilotage and agreed to promote such a system to all ships.

6.2.2. Case study 4: Baltic Sea mandatory ATBAs

The Baltic Sea was designated a PSSA in 2005, following submission of a proposal by all of the Baltic states (with the exception of the Russian Federation) to the 51st session of MEPC (MEPC 51/8/1, 2003). The PSSA includes the entire Baltic Sea area, except Russian sovereign waters, and was primarily proposed to raise awareness of the sensitivity of the Baltic Sea area and to protect its sensitive marine environment from impacts caused by shipping. The uniqueness of the Baltic Sea is reflected in the broad range of international conservation network designations such as Important Bird Areas, Baltic Sea Protected Areas established by the Helsinki Commission, Ramsar sites, National Parks, wildlife sanctuaries and several large Natura 2000 areas established under the European Habitats Directive.

The region has a long history of marine pollution incidents, and correspondingly a comprehensive navigational safety regime. Despite this, there is still evidence of damage arising from the discharge of oil and other harmful substances. Furthermore, according to the proposing states, a large number of shipping incidents occur within the waters, mostly in the vicinity of ports and straits, especially the entrance to the Baltic and in the Gulf of Finland.

In developing the PSSA proposal, the proposing states undertook a detailed analysis of both the vulnerability of the area to the impacts of international shipping and an analysis of

51 Specifically, concerns were raised as to whether the PSSA Guidelines were adequate to address such important issues and whether the adoption of such a measure might require an amendment to SOLAS to provide a legal basis.

the most effective management measures to address the identified vulnerabilities. In support of the PSSA proposal, therefore, the proposing states submitted proposals for several new and amended APMs, including two ATBAs in the southern Baltic Sea. The proposing states argued that the ATBAs should be mandatory on the basis of the ecological significance of the banks, and in particular, their significance in the context of protecting marine biodiversity. It was also argued that the establishment of the ATBAs would reduce the risk of accidents and oil spills in the area. The ATBAs lie entirely within the Swedish EEZ, and therefore IMO approval was a pre-requisite for their implementation.

IMO will not adopt a proposed routeing measure until it is satisfied that the proposed system will not impose unnecessary constraints on shipping and is completely in accordance with the requirements of SOLAS and the GPSR. When determining ATBAs for all ships or certain classes of ships, the necessity for creating such areas should be well demonstrated. In the case of the Baltic Sea, the NAV Sub-committee did not accept the arguments for mandatory status, preferring instead to approve recommended measures in both cases. Given that SOLAS now provides for the establishment of mandatory routeing measures for the purposes of environmental protection, subject to satisfactorily demonstrating the need for such mandatory status, it must be assumed that the Baltic states did not provide a sufficiently strong argument to support the adoption of such a measure. Despite the supposed significant status of PSSA designation, identification of the area as a PSSA in and of itself clearly was not a significant factor in the decision as to whether the ATBAs should be mandatory for the purpose of protecting the marine environment.

6.2.3. Case Study 5: Western European single-hull tanker ban

Following a number of high-profile shipping incidents in the region,⁵² several European states sought designation by IMO of an extensive marine area as a PSSA (Western European PSSA). The application for a PSSA by these European states covered an area encompassing the west coasts

of the United Kingdom, Ireland, Belgium, France, Spain and Portugal, from the Shetland Isles in the north to Cape São Vicente in the South, including the English Channel and its approaches. The proposed area includes a wide range of sites with conservation value, such as Special Areas of Conservation (designated under the European Habitats Directive), Special Protection Areas (designated under the European Birds Directive), Ramsar sites, World Heritage Sites and an unknown number of nationally established MPAs. In addition to several existing measures adopted to reduce the risk of shipping casualties, two APMs were suggested in the application:

- a) A ban on the transit of single-hull tankers carrying heavy fuel oil (HFO) through the area; and
- b) A 48-hour prior reporting requirement.

Opposition to the proposal to ban single-hull tankers was strong and the measure was eventually withdrawn (see Roberts *et al.*, 2005). Prior to this decision, however, significant concerns were raised with regard to the legal basis for such a measure in the context of the proposed PSSA. No clearly identifiable legal basis was put forward by the proponents, although it was suggested that the PSSA Guidelines themselves provided the legal basis for the adoption of such a measure. This is clearly not the case since the Guidelines are contained within a non-binding IMO resolution.

UNCLOS recognises coastal states' rights to regulate discharges from ships but does not permit unilateral regulation of rules and standards that relate to the construction, design, equipment and manning standards for vessels, unless such rules give effect to 'generally accepted international rules or standards.' The generally accepted international rules are those contained within MARPOL 73/78. Thus, while a coastal state may regulate transit within its territorial waters for the purposes of environmental protection, such regulations cannot extend to the prescription of national standards for the construction and design of vessels that are higher than international standards on foreign ships. Notwithstanding that the measure was in fact withdrawn, given

52 High-profile casualties in the area include MV *Braer*, MV *Sea Empress*, MV *Erika*, MV *Ievoli Sun* and MV *Prestige*.

the level of opposition to the ban it is doubtful that agreement would have been reached on the PSSA proposal had the proponents continued to seek approval for such a measure.

6.2.4. Observation

Despite the arguments that PSSA designation provides for the approval of exceptional measures, the examples discussed above demonstrate that there are clearly limits as to how far MEPC is currently prepared to go in adopting measures for the purposes of environmental protection (i) where there exist no generally accepted international rules and standards in international law for the adoption of such measures, and (ii) where such measures may interfere with the principle of freedom of navigation.

MEPC has sent out a clear signal that any measure proposed for the protection of a PSSA must have a clear legal basis. Furthermore, even where the measure is clearly provided for in an existing instrument, as in the case of a mandatory area to be avoided, MEPC has proved reluctant to approve it where it has not been adequately demonstrated that such a restrictive measure is warranted. While a number of observers have proposed new measures that could be applied within the framework of a PSSA, to date MEPC has only accepted those measures that are generally available through existing instruments and have a clear legal basis in international law.

6.3. Application of IMO measures for the purposes of environmental protection

It should also be considered that states are able to take action within their territorial waters provided such action respects the right of innocent passage. Coastal nations might wish to adopt specific routing, pilotage, vessel traffic management or special anchoring measures within territorial seas to reduce the risk to particularly sensitive habitats or populations of wildlife from shipping activity, to improve safety of navigation or to prevent pollution. To highlight this point, an analysis of measures adopted by IMO that are not associated with a PSSA illustrates that numerous states have implemented routing and other protective measures for the purpose of environmental protection without going through the process of

identifying and designating that area as a PSSA. The Appendix provides a summary of a number of measures adopted by IMO since 1994 for areas that have identified environmental values that require protection from the impacts of international shipping. In this regard it is useful to consider a number of specific case studies that show how states have been applying such measures for the purposes of environmental protection.

6.3.1. Case study 6: New Zealand mandatory area to be avoided

The New Zealand government presented its application for a mandatory area to be avoided at the 49th session of the NAV Sub-committee in June 2003 (NAV 49/3, 2003). The purpose of the ATBA is to protect the sensitive coastal environments of the north-east coast of the North Island of New Zealand, including the Poor Knights Islands marine reserve.

The most recent national oil-spill risk assessment clearly identifies this area of the coastline as presenting the highest probability of an oil spill for New Zealand. Furthermore, oil-spill sensitivity analysis has identified the area as among the most sensitive in New Zealand to the impacts of oil. This area is therefore particularly relevant from an environmental protection point of view since it is both highly vulnerable in terms of its sensitivity to spills of oil and other harmful substances, and it is also at the highest risk of such an incident compared to other coastal areas within New Zealand. The adoption of an ATBA for such environmental protection purposes is clearly provided for in Chapter V of SOLAS.

While the application received widespread support, it was noted that the adoption of this measure was a significant step for IMO since this was the first time a mandatory ATBA had been approved.

6.3.2. Case study 7: protection of North Atlantic right whales in the Bay of Fundy

In the late 1990s, it was recognised that the plight of the northern Atlantic right whale was severe and that the major threat to the small remaining population was ship strikes. The whales are particularly vulnerable as they migrate from calving grounds off Florida and Georgia along

the eastern seaboard of the USA to their feeding grounds in Canada's Bay of Fundy. In addition, the commercial shipping lanes leading to New Brunswick and Nova Scotia ran directly through the feeding grounds. In 1999, following adoption by the IMO's Maritime Safety Committee, the USA implemented two mandatory ship reporting systems off the north-eastern and south-eastern coasts. The purpose of the mandatory reporting schemes is to raise awareness of mariners and engage their assistance in reducing the threat of ship strikes.

Subsequent to this, in 2002, a proposal was submitted to IMO to move the existing traffic separation scheme in the Bay of Fundy to avoid conflict with the whales' primary feeding ground (NAV 48/3/5, 2002). The new measures, which moved the shipping lanes four nautical miles east, took effect from mid-July 2003.

Some observers considered that a PSSA may have been an appropriate option, to recognise the vulnerability of the whales while in the Bay of Fundy, since ultimately a number of new measures to improve management of ships in the area to protect the whales are likely to be introduced, and no doubt there would have been a good case for a PSSA. The final decision, however, was to seek the specific measure required to immediately improve the situation regarding ship strikes, and that was to move the shipping lanes away from the whales' feeding grounds. Additional measures are still under consideration, including a possible area to be avoided for the Roseway Basin, and it is possible that a PSSA may still be proposed in the future.

6.3.3. Case study 8: North Sea Special Area

In the mid-1990s, the illegal discharging of oily waste from ships was identified as a major threat to marine wildlife, particularly seabirds, by a Quality Status Report for the North Sea (North Sea Task Force, 1993). Legal discharges were estimated to be in the order of 1,000–1,500 tonnes annually; however, illegal discharges were estimated to be 15,000–60,000 tonnes annually. The discharges were responsible for the death of tens of thousands of seabirds every year in a region supporting exceptionally high concentrations of seabirds offshore and waterfowl in the wetland margins. Despite the clear threat, concern was

expressed at designating the North Sea a Special Area under MARPOL 73/78 Annex 1. (The North Sea had already been designated a Special Area for the purposes of Annex V concerning garbage). One of the primary arguments against seeking the more stringent provisions conferred by Special Area status for oil discharges was the 'boundary effect'. It was suggested that Special Area status, rather than reducing the amount of oil discharged by ships (legally and illegally), would simply move the problem to the boundary of the Special Area and result in increased discharges in adjacent areas. Additionally, many of the adjacent areas were recognised to be important for marine wildlife, including seabird colonies, seal haul-outs and dolphin, porpoise and whale populations.

Lobbying by non-governmental organizations at the time highlighted the argument that, although the 'boundary effect' was a real threat, Special Area status, if correctly applied and enforced, would ultimately reduce the amount of oil discharged by ships, since a number of ships operated solely within the area and were unlikely to make an additional journey to discharge waste outside the protected area. In addition, the concern about increasing oily waste discharges beyond the Special Area in areas vulnerable to oil pollution, while valid, was misleading. Whereas the designation of most of the existing Special Areas had been confined to enclosed and semi-enclosed seas, one Special Area—Antarctica—was not an enclosed or semi-enclosed sea. It was and is, however, extremely vulnerable to the impact of oil pollution. The philosophy behind stringent discharge restrictions on shipping in Special Areas was to provide the necessary level of protection for areas that were particularly vulnerable to the impact of oily waste. As a result, there was no reason why the boundaries for an Annex I Special Area for the North Sea could not be extended into the open ocean—that is to say beyond the limits previously identified for the Annex V Special Area—in order to provide the necessary level of protection, provided the case could be made for taking such action.

Following a 1995 commitment by North Sea governments to seek Special Area Status for the North Sea, NGOs helped collate the necessary biological data to make the case to extend the boundaries, while the governments focused on the shipping data and the proposed measure. The

proposed North West Waters Special Area was adopted in 1997 and entered into force in 1999.

6.4. Comprehensive management tool

One of the purposes of the PSSA concept, and one of its identified benefits, is to provide a comprehensive assessment tool whereby the identified environmental vulnerability is linked with the most appropriate measure(s) to prevent, reduce or eliminate the vulnerability. By this means, the process aims to ensure that the most appropriate measure to address the environmental vulnerability is identified and applied in such a manner as to impose as little restriction on shipping traffic as is practicable, while ensuring effective protection of the area in question. It is therefore incumbent on the applicant(s) not only to identify and justify the specific environmental values that are vulnerable, but also to demonstrate that the proposed measures address that identified vulnerability. The example of the Florida Keys PSSA provides a clear example of how this process can work in practice.

When the USA undertook its evaluation for the Florida Keys PSSA proposal, it used a risk-based approach to identify the areas under greatest threat from international shipping and also identified the specific vulnerability of those areas to the range of impacts associated with shipping activities. Consequently, at the time of submission of its PSSA proposal, the USA was able to clearly demonstrate that it had identified the areas of greatest environmental significance that were at risk from shipping, and that the legal measures proposed specifically targeted that vulnerability. While the USA pointed out that the designation of the PSSA itself would serve to highlight to mariners the environmental sensitivity of the area, arguably one of the most significant benefits of this PSSA was the holistic evaluation of the entire area and the shipping activities within it. While the anchoring problem was an obvious issue, the evaluation identified a number of other issues that had to be addressed through the process. The most apparent of these was the proposal to amend the northern area to be avoided, reducing its size. The process of evaluating and preparing the PSSA proposal included comprehensive consultation with the shipping industry and it was through this process that the USA became aware of the potential threat posed by one of the existing

protective measures (Lindy S. Johnson (NOAA), personal communication). Thus, when applied in an holistic manner, the PSSA concept provides benefits by way of a comprehensive mechanism to assess an area's vulnerability to damage (or the threat thereof) by international shipping, and to adopt IMO measures that are tailored to addressing that vulnerability.

Similarly, in developing the PSSA proposal for the Baltic Sea, the proposing states undertook a detailed analysis of both the vulnerability of the area to the impacts of international shipping and an analysis of the most effective management measures to address the identified vulnerabilities. As noted above, this resulted in the submission of a comprehensive proposal to NAV seeking a broad range of protective measures to address the specific threats identified in the analysis.

The WE PSSA proposal contrasts markedly with the Florida Keys proposal, in that the application failed to clearly assess the specific values that were under threat from international shipping and also failed to demonstrate any specific link between those values that were identified and the proposed APM. As a result, the proposal proved to be highly controversial. An explicit part of any PSSA application is the requirement to demonstrate how the APMs, existing or proposed, will provide the needed protection from the threats of damage posed by international maritime activities that may occur in and around the area. In light of the withdrawal of the single-hull tanker ban, the purpose and effect of the proposed 48-hour reporting obligation was questioned by a number of states and remains unclear in the absence of other measures.

The rationale for choosing an area is often more political than scientific, and a lack of time, funds and data are typical of the process. A repeatable, rigorous approach that can be applied systematically is needed to define optimal sites and optimal zoning within those sites (Villa *et al.*, 2002). There is a number of approaches that could be used to assess the vulnerability of valued ecological features. New Zealand and the United Kingdom have applied semi-quantitative analytical models at a national level to identify Marine Environmental High Risk Areas (MEHRAs) that are vulnerable to the impacts of shipping (Safetec UK, 1999; MSA NZ, 2001).

These approaches use risk-based techniques to complete a comparative analysis of risk for areas within a defined spatial extent. In each case, the environmental sensitivity and the navigational risk were each analysed and combined to identify areas of both high sensitivity and vulnerability to oil spills. On a comparative basis, the most high-risk areas were identified as MEHRAs in each region studied.

The concept of MEHRAs was first introduced in Lord Donaldson's 1994 Report *Safer ships, cleaner seas* (HMSO, 1994), in recognition of the need to reduce the risk of shipping impacts in the UK's territorial waters following the 1993 sinking of the *Braer* in northern Scotland. Following the publication of the Donaldson report, the UK Government undertook a risk assessment exercise to identify those areas within its territorial waters that should be identified as MEHRAs. The UK coast and territorial seas were divided into cells, and for each cell the shipping risk was evaluated based on routeing data, size and type of vessel, traffic density and analysis of past accidents resulting in pollution. A second evaluation identified the environmental sensitivity taking particular account of statutory protected area designations. The combined evaluations produced an overall ranking, which resulted in some 9 percent of the UK coastline being identified as a MEHRA. In February 2006 the Government announced 32 locations within territorial waters that had been identified as MEHRAs on account of their high environmental sensitivity and the risk from shipping. Some sites where protective measures already existed were not included as the risk had already been reduced. The introduction of additional protective measures for these MEHRAs will be considered alongside wider, but inter-linked developments.

Similarly Australia has applied this approach to identify MEHRAs within the boundaries of the Great Barrier Reef Marine Park (Queensland Transport & GBRMP Authority, 2000). A risk assessment was undertaken of the waters of Queensland State and of the Great Barrier Reef Marine Park area, including the production of a shipping profile of the area and the mapping of sensitivity to oil. Wherever high levels of shipping were found alongside a high sensitivity to oil, a MEHRA was identified. MEHRAs include the Torres Strait Islands, the Northern Great Barrier Reef, the

Whitsunday Islands, Hydrographers Passage and the Port of Brisbane. For each of these areas a disaster management concept called Pollution, Preparedness, Response and Recovery, or PPRR, has been applied. In Australia, therefore, the concept of MEHRAs is not only working, but is working alongside the internationally recognised designation of PSSAs.

It has also been suggested that strategic environmental assessment (SEA) could be used as a tool to identify 'gaps' in the existing, but incomplete, network of PSSAs (MEPC 53/INF.10, 2005). SEA is recognised as an important tool for integrating the environment into decision-making, and is among the tools available to achieve ecosystem management.

6.5. Intrinsic benefits of PSSA identification

Notwithstanding the protection that can be provided by the application of specific APMs to address an identified vulnerability, it is widely argued that designation of an area as a PSSA provides global recognition of the special significance of the area through identification of PSSA status on international charts, thereby informing mariners of the importance of taking extra care when navigating through a region. As a result it is argued by some that the designation of an area as a PSSA has an intrinsic value in its own right.

To date, every PSSA proposal submitted to IMO, with the exception of the Wadden Sea, has identified at least one new APM to be adopted to protect the area. It was argued at the time that the necessary associated protective measures for the Wadden Sea had already been applied, so the PSSA designation was effectively 'icing on the cake' with the primary purpose of increasing international awareness of the environmental value of the Wadden Sea. Interestingly, a feasibility study on the Wadden Sea PSSA identified three possible APMs: a vessel traffic management scheme, mandatory reporting for certain vessels, and compulsory pilotage for certain vessels. However, since the area was well defined and had clear environmental values throughout, the proposal proceeded without any concerns being raised, since designation as a PSSA serves to highlight to the shipping industry the importance of taking

extra care when approaching the area. That said, it is unlikely, following recent discussions and revisions of the PSSA Guidelines, that another PSSA proposal might be accepted on a similar basis in the future.

The suggestion that identifying a PSSA on a marine chart will affect the decision-making of a ship's master and crew seems overly optimistic. Simply marking an area on a chart as being environmentally significant does not offer automatic protection to the area, and unpublished research undertaken by one of the authors (see also Roberts, 2006a) indicates that there is not a high level of awareness of the PSSA concept among mariners. Notwithstanding this, there is also some evidence that, when made aware of such an area, mariners will identify the PSSA concept with areas of environmental significance, where greater caution is required. However, it does appear that some confusion exists among mariners as to the difference between a PSSA and an ATBA.

Numerous factors are taken into account by a ship's crew when making operational decisions with regard to the navigation of a ship, including the schedules for port arrival and departure, the status of a specific protective measure, specific company policies and directives, information provided to companies and agents, including by Notices to Mariners, as well as safety and environmental factors in the area to be transited. If PSSA proposals or other shipping management protective measures are to be successful once adopted by IMO Member States, it is essential that ships' masters and crews recognise the threat and understand the need to follow the measures introduced. Even though 400 or more delegates at IMO may have agreed a new PSSA and it has been marked on nautical charts, if ships' masters and crews are not aware of the threat and do not understand the need for the protective measure(s) the purpose of the PSSA is undermined.

For example, as a result of poor compliance with the ATBA adopted for the Poor Knights Islands, New Zealand embarked on a targeted campaign aimed at advising shipping agents, shipping companies and all international vessels visiting New Zealand ports of the existence of the measure. The area is also now being monitored

using AIS, with the result that ships entering the area can be clearly identified in real time. Furthermore, a comprehensive programme aimed at enforcement against those ships violating the ATBA has been underway since August 2005. Since the implementation of these additional measures, compliance with the measure has increased markedly, with the number of ships reported transiting the area having declined significantly.

In the Great Barrier Reef PSSA, an ATBA around the Capricornia section of the Great Barrier Reef Marine Park is to be revoked following a number of breaches by international shipping. The ATBA has been in place for a number of years but was never made mandatory under Australian domestic legislation. Thus, despite the significance of the PSSA and the fact that both the PSSA and the ATBA are clearly marked on international charts, compliance by international shipping with the measure has not been adequate. With the implementation of the Representative Areas Programme, it was recognised that the previous zoning did not adequately protect the entire range of plants and animals and should be revised. As a result, the Great Barrier Reef Marine Park was comprehensively rezoned, and ships transiting the Marine Park without a permit may now only access the designated Shipping Area and the General Use Zone. These areas were selected for navigational and environmental reasons to allow for industry growth, new routes and access to ports. To access all other areas, ships require a permit.

When such a measure is implemented at a national level, it is clearly not sufficient to rely on the information provided on marine charts to inform mariners of the need to take special precautions when navigating in the vicinity of environmentally sensitive areas. The implementation of such a measure requires rigorous monitoring of its effectiveness, as well as targeted education to ensure that all relevant parties are aware of the requirement for such precautions and the reasons for these precautions. These are all aspects that should be considered when the establishment and implementation of a routing measure or a PSSA is being planned. As has been observed in both New Zealand and Australia, when these factors are combined with the designation of an

area and its definition on international maritime charts, compliance with the measures is likely to be relatively high.

To sum up, it is clear from the PSSAs adopted to date that states are interpreting and applying the PSSA concept in different ways. In some cases states have clearly utilized the PSSA concept as a decision support process to evaluate the specific threat posed by international shipping, thereby allowing them to narrowly tailor the most effective measures to address that threat. However, other states appear to be designating areas as PSSAs more for their iconic status rather than for any demonstrated protection that can be derived from such designation. Moreover, recently there have been cases whereby states have attempted to use PSSA designation to support the adoption by IMO of measures that may interfere with navigational freedoms.

Despite the many benefits that are argued for PSSA designation, an examination of state practice raises a number of questions about its real benefits. In terms of legal protection, designation of an area as a PSSA provides no additional benefit to the adoption of ships' routing measures, ship reporting systems and vessel traffic systems, which may be implemented with or without the designation of a PSSA. Therefore the only additional benefits that can be realized are those non-legal, intrinsic benefits that result in the global recognition of an area as a PSSA. However, simply identifying an area on a chart as particularly sensitive is unlikely to provide significant benefits in terms of reducing threats, since numerous factors must be taken into account by a ship's crew when making operational decisions regarding navigation. Even the adoption of specific ships' routing measures have not, on their own, been sufficient to indicate to mariners that extra caution is warranted while operating within a defined area. However, where such intrinsic benefits do appear to have been apparent is where the designation has been accompanied by targeted campaigns to educate mariners of the special significance of the area, supported by comprehensive monitoring and enforcement. Thus, notwithstanding the benefits that may be realized by using the PSSA as a vehicle for educating mariners about the special significance of the area, arguably the most significant benefits that can be realized by identifying and designating a PSSA are those related to the process of

evaluating the environmental vulnerability of an area and identifying the most appropriate measure(s) to prevent, reduce or eliminate that vulnerability.

The benefits of this approach were clearly realized in the case of the Florida Keys, and in other examples discussed above. However, in order to fully realize the benefits of this approach there is a need for PSSA proposals to be comprehensive in their analysis and for the process by which such proposals are evaluated to be undertaken in a rigorous and consistent manner. While the requirements for PSSA proposals appear to be clearly set forth in the PSSA Guidelines, the interpretation and application of these requirements, as demonstrated by both state and IMO practice, has in some cases been inconsistent. The apparent lack of rigour demonstrated in the preparation and consideration of some recent proposals has resulted in unforeseen political manoeuvring by some states and industry bodies to constrain and redirect the PSSA concept.

6.6. To PSSA or not to PSSA

Given the purported benefits of PSSA designation, it might be reasonably assumed that IMO Member States would preferentially apply such a measure, which has been specifically established for the protection of sensitive marine areas. However, despite the introduction of the PSSA concept 15 years ago, current state practice (as illustrated in the Appendix) suggests that the application of ships' routing measures remains a more favourable option for the protection of sensitive areas from the impacts of shipping than the PSSA concept. This is despite the increasing application of the PSSA tool itself.

In its consideration of the options available to protect the area around the Poor Knights marine reserve, New Zealand considered the possible application of the PSSA concept. Given that the state wished to exclude shipping from the area, the designation of an ATBA was essential irrespective of whether PSSA designation was sought. Notwithstanding the possible benefits that might be derived from a PSSA designation, in its analysis New Zealand concluded that the ATBA as a measure in its own right would provide the same level of protection as a PSSA designation. Furthermore, by simply adopting the

ATBA there was no need to undertake the lengthy process of applying for a PSSA through IMO. Further consideration was also given to the level of shipping in the area, which although high in the context of New Zealand, is not high by international standards. As a result, it was considered unlikely that the vulnerability test would be met for the designation of a PSSA.

Similarly, when proposing the Florida Keys National Marine Sanctuary as a PSSA, the USA also considered whether three other areas⁵³ should be proposed for PSSA designation. It undertook an elaborate reasoning process to determine whether the advantages of PSSA

status outweighed the extra time it would take to obtain it, as well as the consequent delay in adopting protective measures that had to go through two or more committees. As with the New Zealand example, the level of traffic in each of the three areas was also a consideration in the decision as to whether to pursue PSSA designation.

States contemplating the development of a PSSA proposal should therefore give detailed consideration to the conservation benefits that will be realized by such a designation, rather than by the adoption and full implementation of the respective IMO measures.

53 The three areas were: (i) the Monterey Bay National Marine Sanctuary; (ii) the Flower Garden Banks National Marine Sanctuary; and (iii) parts of the marine area off the East Coast of the USA where North Atlantic right whales breed.

7. Valuable lessons learned from state practice

Given the experience gained from the implementation of PSSAs to date, what lessons can be learned? Although 11 PSSAs have been designated over a 15-year period, there is relatively little documented experience from which to evaluate the success or failure of the concept. Many of the PSSAs have only recently been designated and implemented, and insufficient time has elapsed for any meaningful assessment of the success of the APMs in achieving their objectives. Furthermore, there is no requirement on states implementing PSSAs to undertake monitoring, evaluation or reporting of the PSSA and APMs.

In recent years, increasing concern has been expressed about the so-called ‘proliferation’ of PSSAs. This is, no doubt, due to the fact that very few PSSAs were designated in the early 1990s and an increasing number of proposals have come forward since 2000. The ‘proliferation’ is most likely due to increased awareness of the PSSA concept as a shipping management tool, and the concern is a result of poor understanding and limited experience in the use of the guidelines. In view of the existing concern over such ‘proliferation’, if new proposals are to be considered it will be essential to make best use of the experience gained from PSSA designations to date. There are a number of lessons relevant to the process of developing and submitting a PSSA proposal.

7.1. Successful PSSA designation practice

7.1.1. Application of risk assessment techniques

Two of the critical elements of a PSSA proposal are sensitivity and vulnerability. Many areas of the world’s seas and oceans are sensitive; however, they are not necessarily vulnerable if international shipping is not using the sea area or adjacent areas. Risk assessment is a management tool which can be used to determine the combined

sensitivity and vulnerability of an area. While a formal risk assessment is not a requirement of a PSSA proposal, it has been used successfully to support the case of a number of PSSAs, and also been used nationally by Australia, New Zealand and the UK in the identification of MEHRAs (Safetec UK, 1999; Queensland Transport & GBRMP Authority, 2000; MSA NZ, 2001).

Although the Baltic states did not formally present a risk assessment with the Baltic Sea PSSA proposal, it is clear from the proposal (MEPC 51/8/1, 2003) that some form of risk assessment has been undertaken. Not only does the proposal outline current shipping activity in the form of ship numbers and cargoes, it also predicts a significant increase in the volume of shipping traffic, particularly oil - and chemical-carrying vessels, over the coming decade or more, together with a commensurate increase in risk.

Similarly the USA did not present a formal risk assessment for the Florida Keys PSSA, but it is clear from the proposal (MEPC 46/6/2, 2001) that identification of the measures to address the risks to the fragile coral reef ecosystem was based on a risk assessment. The result is three APMs— four ATBAs, an amendment to an existing ATBA, and three mandatory no-anchoring areas—that address the vulnerability of the areas to damage by international shipping activity.

7.1.2. Raising awareness of the problem(s) to be addressed

There are two aspects to the importance of raising awareness of the problem that the PSSA is designed to address: a) improving the chances of the PSSA proposal being adopted, and b) improving the implementation and enforcement of the PSSA and its APMs.

While no formal assessment has been undertaken, it is the view of the authors that when states submitting PSSA proposals have made efforts to raise awareness of the threat(s) and the importance

of new protective measures before the proposal has been considered, they have had greater success with their proposals in a shorter time. It is important not only to increase awareness of the need to improve the management of shipping in order to reduce its environmental impact, but also to improve or at least maintain navigation safety.

The Florida Keys PSSA is a particularly successful case. By the time the PSSA came up for discussion at MEPC 46 in 2001, most delegates were aware of the problem and the proposed solution and supported the proposal to designate a PSSA. Considerable effort was put into raising awareness of the threat posed by international shipping to the coral reefs of the Florida Keys, both locally in Florida—including wide consultation with the shipping industry to ensure that the APMs proposed were workable—and internationally at IMO. The stated objective of the PSSA proposal was to address the area's vulnerability to damage by international shipping, to increase maritime safety, and to heighten mariners' awareness of the sensitivity of and risks to navigation in the area. In developing the proposal care was taken to address navigation interests, improve maritime safety and minimize the economic impact on the shipping industry while still achieving the objectives. In Florida, publicity around the threats to the coral reefs, important economically and aesthetically, meant that there was strong support and acceptance locally of the need for action to better manage international shipping (Bill Causey (NOAA), personal communication, July 2006). A press conference in Washington, DC caught national and international attention and generated further support for the PSSA designation. During MEPC 45 a number of awareness-raising and promotional activities were undertaken, including a display in the Delegate's Lounge throughout the MEPC meeting and an informal presentation to delegates.

Although not in the context of a PSSA, a similar level of effort was put into amending shipping management measures to protect the highly endangered North Atlantic right whale population from ship strikes while in its summer feeding grounds in the Bay of Fundy, Canada (NAV 45/Inf3, 1999; NAV 48/3/5, 2002). Scientific evidence was presented to make the case for moving the shipping lanes, including evidence that whales do not move away from ship noise, information that

collisions with ships accounted for more than half of whale deaths, and data on the concentrations of the whales and their feeding grounds. Extensive efforts were also undertaken to gain support from the local community; in particular regular meetings were organized with the shippers and ports in the Bay of Fundy. A working group including relevant government departments, shipping industry officials, whale research scientists, and fishing and whale-watching communities was established to develop the final proposal, which not only addressed the threat to the right whales but also ensured the continued safety of commercial operations. It was submitted to IMO, where presentations were given on the whales and the vulnerability to ship strikes, and materials, including pens, were made available. As a result of these efforts to raise awareness of the problem and the potential solution, the strength of feeling at the NAV Sub-committee's 48th Session in 2002 prompted one flag state delegate to support the proposed change in shipping lanes by stating 'we must do the right thing, for right whales, right now'.

In contrast, the 2003 Western European PSSA proposal was presented at MEPC with little previous consultation other than amongst the EU Member States submitting the proposal. Even NGOs that had been lobbying for PSSA designations in the region for many years were not informed of the proposal until it had been submitted. As a result, largely because of the large size of the proposed PSSA and the proposed ban on single-hull tankers, there were serious reservations about the proposal. While these were addressed to a certain extent by amending the APMs and removing the single-hull tanker ban, a large number of states still did not support the proposal. It is arguable that broader consultation and greater efforts to raise awareness ahead of submitting the proposal would have identified the grave concern about the APM banning single-hull vessels earlier, and a proposal with greater support could have been presented at MEPC.

7.1.3. Gaining political support

Inevitably, regional support for a PSSA is essential, particularly if the PSSA spans the waters of a number of countries and/or covers major international shipping routes. Although there is no evidence to date, concern has been expressed in

the past that PSSAs could be used for political or even financial gain, by restricting access to the ports of one country in favour of another or by restricting access through international straits. If a PSSA is proposed for an enclosed sea area or within an enclosed sea area such as the Mediterranean, experience has shown that it is essential to start by gaining the support of neighbouring countries.

The Wadden Sea and Baltic Sea PSSAs are excellent examples of the generation of local and regional political support. In the case of the Wadden Sea, three coastal states—Denmark, Germany and the Netherlands—had been working together for over 20 years to protect the area because of its high nature conservation importance for millions of migratory seabirds and waterfowl each year (WWF-Deutschland, 2002). Their efforts, however, while successful in many respects, had failed to adequately address shipping threats. Previously concerns had been raised about promoting the Wadden Sea as a PSSA because it would create a perceived unfair disadvantage for the major shipping ports within the PSSA. Following the *Pallas* accident in 1998, however, a number of new measures were introduced, including in late 2001 a commitment from the three states to seek PSSA designation for the Wadden Sea. Having gained political support around the Wadden Sea, the three coastal states successfully sought support from other North Sea states (Bergen Declaration, 2002, para. 49) before submitting a proposal to IMO, which was adopted a year later as the first transboundary PSSA.

The decision to work purposefully together for a transboundary PSSA was a crucial step not only for the designation itself, but also for improved shipping safety in the Wadden Sea in the longer term. It is also expected that shipping will benefit from this collaboration through greater harmonization of shipping management in the Wadden Sea, faster emergency response, and greater ease in identifying vessels that ignore the international rules that are already in place.

The Baltic Sea PSSA is another good example of working to develop regional political support ahead of submitting a proposal to IMO. At the time the Baltic Sea PSSA proposal was submitted in 2004, eight of the nine Baltic Sea coastal states had worked collaboratively

for some time to develop the joint proposal, including making a political commitment to action in a 2003 Ministerial Declaration (Helsinki Commission, 2003). The Baltic states, through the regional Helsinki Commission (HELCOM), had sought to gain support from Russia too; this ultimately proved impossible, and Russian waters are excluded from the PSSA. By working collaboratively through HELCOM, all nine Baltic states were able to make a commitment in the 2003 HELCOM Bremen Declaration to increase their efforts to ensure the safety of navigation and emergency capacity in the Baltic Sea Area, to fully implement their obligations in those fields, and to enhance cooperation on maritime safety within the Baltic Sea, with the objective of preventing maritime accidents and consequent pollution.

7.1.4. Use of local networks

When states are considering how to publicize the threat to an area and the need for new management measures, including the possible designation of a PSSA, local networks can be invaluable in building awareness and developing support. Local networks also frequently hold data that may be valuable for the development of a proposal. After a series of polluting incidents, national and regional environmental NGOs in Europe lobbied extensively for the designation of the Wadden Sea PSSA and the Baltic Sea PSSA ahead of coastal state proposals being submitted, thus helping to develop awareness of the threats, generate political commitment and develop an acceptance amongst relevant stakeholders of the need for action. In both cases, environmental NGOs with consultative status at IMO submitted papers supporting the case for PSSA designation or presenting additional evidence, and made verbal statements supporting the designations at the meetings.

Use of local networks need not be restricted to environmental NGOs. In many regions industry-based networks also operate. It is essential to consult and generate support from local shipping industry networks, particularly since these are likely to be the bodies responsible for abiding by new APMs established under a PSSA designation. In the case of both the Florida Keys PSSA and the Bay of Fundy traffic separation scheme the proposed measures were discussed with the shipping industry prior to submission to IMO.

With over 100 delegations at IMO, including flag states, coastal states, inter-governmental and non-governmental organizations, supportive NGOs—either environmental or industry based—can be a useful resource for lobbying on the sidelines of an IMO meeting.

7.1.5. Fully developing the proposal

Over the past 15 years, it is notable that several PSSA proposals have been submitted, given relatively little questioning, and adopted. Inevitably, any proposed APMs were reviewed by the appropriate sub-committee, generally the Navigation Sub-committee (NAV), before the proposed PSSA was given final endorsement. The Florida Keys PSSA, the Galapagos PSSA and the Canary Islands PSSA are examples. Other PSSA proposals have generated greater concern or reservations and have been subject to more intense scrutiny, as occurred with the Sabana-Camagüey PSSA, the Malpelo Islands PSSA, the Western European PSSA and the Baltic Sea PSSA. The more fully developed a proposal is before submission, and provided it does not raise a contentious issue such as compulsory pilotage for an international strait, as in the case of the Torres Strait PSSA, the greater the likelihood that it will follow a straightforward path through the intricacies of the IMO system.

The 2001 Guidelines were clear that a proposal could be submitted and a PSSA be designated in principle provided that the APMs would follow within two years. The Baltic states made use of this guideline and the initial Baltic Sea PSSA proposal contained no APMs, although it was clear that these would be presented subsequently—as indeed they were at the next opportunity.

In the meantime, however, increasing concern was being raised about the proliferation of PSSAs and the fact that some PSSAs had no APMs at the time of the initial submission, allowing some states to question the value of the proposed PSSA in addressing the risk posed by international shipping activity. Was there any value in identifying a highly sensitive area vulnerable to the impact of shipping activities, but not taking action to reduce the threat or risk? The latest revision of the guidelines in 2005 makes it clear that now a PSSA proposal will only be accepted if it is fully developed and considers all three elements:

sensitivity, vulnerability, and APMs to address the threat; it remains possible to introduce a PSSA proposal without any new APMs only if measures have already been adopted to mitigate the risks.

Interestingly, most questions on PSSA proposals have referred to the vulnerability of the site or the proposed APMs. Never has the environmental sensitivity been questioned ... but then most MEPC delegates are not marine scientists!

7.2. Learning from experience

7.2.1. Defining the scope of a PSSA

A fundamental question that remains unresolved is whether the PSSA concept should be limited only to the most outstanding, clearly defined and geographically limited areas, or whether it should be more broadly applied to any environmentally sensitive area as a management framework within which to develop appropriate protective measures. Opinion within IMO on this is divided. A number of states and industry observers have raised concerns over the risk of the PSSA concept becoming under-valued. In a joint submission to MEPC, a number of industry NGOs observed: 'It is becoming increasingly evident that, if allowed to proliferate unchecked, the PSSA designation will lose its special significance and thereby become devalued.'

While the PSSA Guidelines do not address this issue explicitly, there is an implication that sites identified for designation as a PSSA should be outstanding examples of their type since, as the PSSA Guidelines note, consideration should also be given to the potential for the area to be listed on the World Heritage List, declared a Biosphere Reserve or included on a list of international, regional or national importance. By inference, this suggests that it was envisaged at the time of drafting the guidelines that candidate sites for PSSA designation would also exhibit similar outstanding characteristics to those other international designations identified. Numerous examples currently exist of PSSA sites that also meet the requirements of one or more of these designations. For example, the Great Barrier Reef and Galapagos Islands are both included on the World Heritage List and the Wadden Sea is designated as a Ramsar Site. Similarly, a number of World Heritage Sites, Ramsar Sites and Biosphere

Reserves are located within the boundaries of the Western European and the Baltic Sea PSSAs, although neither area is currently designated as such in its entirety.

7.2.2. Application of the PSSA concept to wide geographic areas

Size is a very important issue on which the PSSA Guidelines are silent. However, the PSSA Guidelines do require that, in assessing each PSSA proposal, IMO should take into account the criteria which are set forth in the Guidelines, and in particular should consider ‘... whether the size of the area is commensurate with that necessary to address the identified need’ (Assembly Resolution A.982(24), 2005).

In its analysis of the WE PSSA application, IMO failed to record a decision as to whether the size of the proposed PSSA was commensurate with that necessary to address the identified need. A general finding of the group was that, although parts of the PSSA met many of the criteria, few if any of the criteria were applicable to the PSSA in its entirety. Given the large number of discrete sensitive areas within the proposed area, several delegations argued that a more appropriate approach would have been to identify a number of smaller PSSAs within the area. What is at issue therefore, is not the size of the area *per se*, but rather whether it can be demonstrated that the boundary of the proposed PSSA accurately reflects the limits of the environmental vulnerability.

One way to address the issue of large geographic areas and defining the limits of the environmental vulnerability may be to apply the concept of the buffer zone in a comprehensive manner. The PSSA Guidelines provide for the identification of a buffer zone around a core zone, but within the boundaries of the PSSA. In its present form, however, the concept of the buffer zone in the context of a PSSA is problematic.

To date, the only PSSA to have utilized the concept of the buffer zone is the Galapagos PSSA. In its proposal to designate the PSSA around the Galapagos Islands, Ecuador put forward the designation of a PSSA 12 nautical miles wide around the entire archipelago. However, as an APM to protect the PSSA they also proposed an ATBA 24 nautical miles wide

around the entire archipelago. Therefore the PSSA lies entirely within the ATBA. While not explicitly referred to as such in the proposal, clearly the extended ATBA does provide a buffer zone around the PSSA.

A case was also made by environmental NGOs for defining the Wadden Sea PSSA as a core area with a contiguous buffer zone extending offshore to include areas of hazard (WWF Wadden Sea Ecoregion Programme, personal communication, 2001). A buffer zone, which was ultimately not included in the PSSA proposal, could have encompassed an area where the prevailing direction of wind and currents would send accidental or operational pollutants in the direction of the most environmentally significant parts of the Wadden Sea. New APMs could have been introduced in a buffer zone to minimize the risks. Environmental NGOs expressed disappointment that the final PSSA proposal omitted the buffer zone; however, the idea could possibly be reconsidered in the future.

In practice, it would be possible to have several PSSAs (core areas) within a single buffer zone, as is the case with Biosphere Reserves. Given the suggestion raised by several states for the identification of several smaller PSSAs within both the WE PSSA and the Baltic Sea, this in fact would more accurately have reflected the situation that existed in both of these areas. For example, it might be possible to identify a number of PSSAs and to designate a buffer zone in the form of a precautionary area around these.

7.2.3. Linkage between vulnerability and APMs

Designation of an area as a PSSA should require a demonstrable link between the threat posed by shipping activities and the legal measures to protect the area. This approach was clearly highlighted in the Florida Keys example and, despite the concerns raised over the proposed pilotage regime, also in the Torres Strait example. However, in some cases this link has been far from clear, notably in the Western European and Baltic PSSA proposals.

7.2.4. Appropriate APMs

During the past 2–3 years, it has been difficult to ascertain from some PSSA applications submitted

whether proposed APMs fulfil the requirements of the pertinent legal instrument establishing them. Moreover, it is clear from the discussions at IMO over the past two years that there exists a divergence of opinion on interpretation of the provisions of UNCLOS, insofar as it relates to the legal basis for PSSA protection measures. IMO appears to have taken the position that any proposed measure

must have a clear legal basis in an existing IMO instrument, or it must at least be demonstrated how such a legal basis is to be established.

As a result, any future proposals for PSSA designation *must* include a proposal for an APM including a clear analysis of the basis of that measure under international law.

8. The Mediterranean: a brief history of engagement on PSSAs

There has been considerable interest in designating PSSAs in the Mediterranean for many years and a number of possible locations have been mentioned both informally and formally. While there has been no suggestion that the whole of the Mediterranean Sea would be designated as a PSSA, following the designation of other large PSSAs in European waters concern has been expressed that such a proposal may come forward. Though carefully developed cases for PSSAs in the Mediterranean should be well received, there is a strong view that another very large PSSA in European waters could undermine the value of PSSA designation. The case for PSSAs in the Mediterranean, however, has probably never been stronger. Maritime traffic throughout European waters is predicted to increase in the next decade, and the European Union's 2003 14-point plan to promote 'motorways of the sea' to encourage short sea shipping identified two (of four) potential 'motorways' in the Mediterranean (European Commission, 2008).

8.1. Potential cases for possible PSSAs in the Mediterranean

In the mid-1990s, members of the Turkish delegation informally expressed interest in the value of a PSSA for the straits of the Bosphorus to better manage shipping in these very congested waters. A proposal to designate the Bosphorus is likely, however, to generate considerable concern that this might be a way of restricting rather than managing traffic in an international strait. The recent designation of the Torres Strait following a proposal by the Governments of Australia and Papua New Guinea, does set a precedent for international straits, although the compulsory pilotage sought was only accepted as a voluntary rather than a mandatory measure.

More recently, following the designation of the Ligurian Cetacean Sanctuary, the Monaco Government informally announced its intention to put forward (presumably with France and Italy) a proposal to designate the Ligurian Sea as a PSSA.

There have also been suggestions that the Straits of Bonifacio, between Sardinia and Corsica, could be considered for designation as a PSSA and a voluntary agreement to this effect was signed by three Italian Ministries (Industry, Transport, and Environment), national industry and maritime organizations, environmental non-governmental organizations and labour corporations in 2001 (G. Rak, personnel communication, 31/08/2006). There has, however, been little follow-up.

A number of governments with shores on the Adriatic Sea have participated in the PSSA technical group and working group meetings at MEPC and informally there has been a suggestion that there might be interest in developing a PSSA proposal for designating part or all of the Adriatic Sea as a PSSA.

Following the *Prestige* oil spill in Galicia in 2002, WWF Spain called for a number of PSSAs to be considered in Spanish waters, including the Alboran Sea in the western Mediterranean. Most of the Atlantic coast waters and the Canary Islands waters proposed by WWF Spain have been encompassed by the Western European PSSA and the Canary Islands PSSA respectively; little consideration has been given so far, however, to designating the Alboran Sea as a PSSA. This would again raise concerns around designating international straits.

In 2003 WWF's Mediterranean Programme made a submission to the Barcelona Convention proposing that nine larger areas of the Mediterranean be considered PSSAs. The nine areas covered are the Alboran Sea; the Balearic Islands; the Sardo-Corso-Liguro-Provençal Basin; the Adriatic Sea; the Aegean and Marmara Seas with the Dardanelles and Bosphorus Straits; the Sicily and Malta Channels and Strait of Messina; the Ionian Islands; the Cirenica Coast; and Iskenderun Bay and the Cilician Coast.

PSSAs have been discussed within the framework of the Barcelona Convention a number of times,

most recently during the 14th Meeting of the Contracting Parties to the Barcelona Convention in 2005, when Members invited the Secretariat 'to assist countries, in close cooperation with REMPEC, to conduct the assessment of those SPAMIs that could be proposed for designation as PSSAs by IMO' (UNEP (DEPI)/MED IG.16/13). SPAMIs are Specially Protected Areas of Mediterranean Interest designated under the Barcelona Convention; most are currently relatively small in size, coastal in nature and with the exception of the Ligurian Cetacean Sanctuary are within territorial waters.

While the Barcelona Convention has no remit in the designation of PSSAs, generating a regional groundswell of support for PSSA designations has proved valuable in other regions for developing the necessary momentum for adoption of new PSSAs at IMO. However, the promotion of possible PSSAs will still need to be undertaken in accordance with the procedures set out in the 2005 PSSA Guidelines and will need to comprise an assessment of environmental sensitivity and of vulnerability to the impact of shipping activity, and the necessary measures (APMs) to reduce or mitigate the threat.

A useful first step is to undertake a form of risk assessment identifying those areas in the Mediterranean considered to be environmentally sensitive and those areas where shipping intensity or the nature of cargoes being shipped

pose a potential or actual threat to ecological, social, cultural and economic, or scientific and educational resources. As previously mentioned, PSSAs are not marine protected areas but a spatial shipping management tool. By considering existing MPA networks in the Mediterranean—and bearing in mind that such networks are still under development and that high seas MPAs, in particular, have not been adequately addressed—it may be possible to begin to narrow down areas that might meet the first two conditions of PSSA designation: sensitivity and vulnerability.

By undertaking an analysis of shipping movements throughout the Mediterranean, using Geographic Information System analysis tools, it is possible to develop a picture of shipping activity and broadly prioritize areas where shipping concentrates and where ecological sensitivity is believed to be particularly high. It should, however, be recognised that this would not be sufficient to identify all areas in need of protection from shipping activity, but it could lead to a region-by-region approach, where a more detailed assessment, covering a wide range of environmental and economic parameters, would be possible to ensure that all sensitive and vulnerable sites were adequately mapped. Once this was done candidate PSSAs could be identified. The number and size of candidate PSSAs would be likely to vary according to the assessment, and groupings of sensitive and vulnerable sites might be considered appropriate if suitable clusters were identified.

9. References

Abdulla, A. and Linden, O. (eds) (In press).

Maritime traffic effects on biodiversity in the Mediterranean Sea: Review of impacts, priority areas and mitigation measures. Gland, Switzerland and Málaga, Spain: IUCN.

Agardy, T. (1997).

Marine protected areas and ocean conservation. Georgetown, Texas: R.G. Landes Company.

Bergen Declaration (2002).

Bergen Declaration. Fifth International Conference on the Protection of the North Sea, 20–21 March 2002, Bergen, Norway. Available at http://www.regjeringen.no/nb/dep/md/dok/rapporter_planer/rapporter/2002/T-1410-Bergen-Declaration.html?id=420161

Birnie, P. (1997).

‘The status of environmental “soft law”: Trends and examples with special focus on IMO norms’. In: H. Ringbom (ed.), *Competing norms in the law of marine environmental protection: Focus on ship safety and pollution prevention*, pp.31–57. London, UK, The Hague, the Netherlands, and Boston, Massachusetts: Kluwer Law International.

Blanco-Bazán, A. (2003).

‘The environmental UNCLOS and the work of the IMO in the field of prevention of pollution from vessels’. In: A. Kirchner (ed.), *International marine environmental law: Institutions, implementation and innovations*, pp. 31–47. London, UK, The Hague, the Netherlands, and Boston, Massachusetts: Kluwer Law International.

Bodansky, D. (1991).

‘Protecting the marine environment from vessel-source pollution: UNCLOS III and beyond’. *Ecology Law Quarterly*, 18:719–777.

Chadwick, V., Aston, J. and Manson, G. (2004).

‘Rezoning the Great Barrier Reef Marine Park: Implications for ship safety, pollution prevention and response’. In: *Proceedings of the Tenth International Oil Spill Conference (SPILLCON)*, Brisbane, Australia, 24–27 August 2004, Available online at <http://www.spillcon.com/2004/papers/CHADWICK.pdf>

Chadwick, V. and Storrie, J. (2001).

‘Shipping issues within the great barrier reef,’ Unpublished conference paper.

Chircop, A. (2005).

‘Particularly sensitive sea areas and international navigation rights: Trends, controversies and emerging issues’. In: I. Davies (ed.), *Issues in international commercial law*, pp.217–242. Aldershot, UK: Ashgate Publishing.

De Fontaubert, A.C., Downes, D.R. and Agardy, T. (1996).

Biodiversity in the seas: Implementing the Convention on Biological Diversity in marine and coastal habitats. IUCN Environmental Policy and Law Paper No 32. Gland, Switzerland: IUCN, 1996.

De Klemm, C. (1993).

Biological diversity conservation and the law. Gland, Switzerland: IUCN.

De La Fayette, L.

'The Marine Environment Protection Committee: The conjunction of the law of the sea and international environmental law'. *International Journal of Marine and Coastal Law*, 16:155–238.

European Commission (2008).

'Intermodal transport: motorways of the sea'. [Internet site] http://ec.europa.eu/transport/intermodality/motorways_sea/index_en.htm

Frank, V. (2005).

'Consequences of the *Prestige* sinking for European and international law'. *International Journal of Marine and Coastal Law*, 20:1–64.

Gjerde, K.M. (2001).

'Protecting particularly sensitive sea areas from shipping: A review of IMO's new PSSA guidelines'. In: H. Thiel and J. A. Koslow (eds), *Managing risks to biodiversity and the environment on the high sea, including tools such as marine protected areas: Scientific requirements and legal aspects*, pp.123–132. Bonn, Germany: German Federal Agency for Nature Conservation.

Gjerde, K.M. and Ong, D. (1993).

'Protection of particularly sensitive sea areas under international marine environment law'. *Marine Pollution Bulletin*, 26:9–13.

Gjerde K.M. and Pullen, J.S.H. (1998).

'Cuba's Sabana-Camagüey Archipelago: The second internationally recognised particularly sensitive sea area'. *International Journal of Marine and Coastal Law*, 13:246–262.

Helsinki Commission (2003).

'HELCOM Ministerial Declaration (HELCOM Bremen Declaration)'. Available online at http://www.helcom.fi/ministerial_declarations/en_GB/helcomdeclaration/

HMSO (1994).

Safer ships, cleaner seas. Report of Lord Donaldson's Inquiry into the prevention of pollution from merchant shipping. London, UK: HMSO.

Hudson, J.H. and Goodwin, W.B. (2001).

'Assessment of vessel grounding injury to coral reef and seagrass habitats in the Florida Keys National Marine Sanctuary, Florida: protocols and methods'. *Bulletin of Marine Science*, 69:509–516.

Kelleher, G., Bleakley, C. and Wells, S. (1995).

A global representative system of marine protected areas: Volume 1 Antarctic, Arctic, Mediterranean, Northwest Atlantic, Northeast Atlantic and Baltic. Washington, DC: World Bank.

Mabile, S. and Piante, C. (2005).

Global directory of Mediterranean marine protected areas. Paris, France: WWF-France.

Macdonald, J.C. (1996).

'The Australian REEFREP system: A coastal vessel traffic information service and ship reporting system for the Torres Strait region and the inner route of the Great Barrier Reef'. *Journal of Navigation*, 49:299–308.

Morin, T. (2001).

'Sanctuary Advisory Councils: Involving the public in the National Marine Sanctuary Program'. *Coastal Management*, 29:327–339.

MSA NZ (Maritime Safety Authority of New Zealand) (2001).

Review of the voluntary vessel routing code for shipping in New Zealand coastal waters. Wellington, New Zealand: MSA.

North Sea Task Force (1993).

North Sea quality status report, 1993. Oslo and Paris Commissions, London. Fredensborg, Denmark: Olsen and Olsen.

Ottesen, P., Sparkes, S. and Trinder, C. (1994).

'Shipping threats and protection of the Great Barrier Reef Marine Park: The role of the particularly sensitive sea area'. *International Journal of Marine and Coastal Law*, 9:518–522.

Peet, G. (1994).

'Particularly sensitive sea areas—A documentary history'. *International Journal of Marine and Coastal Law*, 9:469–506.

Precht, W. F., Aronson, R.B. and Swanson, D.W. (2001).

'Improving scientific decision-making in restoration of ship-grounding sites on coral reefs'. *Bulletin of Marine Science*, 69:1001–1012.

Queensland Transport and GBRMP Authority (2000).

Oil Spill Risk Assessment for the coastal waters of Queensland and the Great Barrier Reef Marine Park. Report prepared by Queensland Transport and the Great Barrier Reef Marine Park Authority, August 2000. Available online at: http://www.msq.qld.gov.au/Home/Environment/Oil_spill_risk_assessment/, accessed 23 January 2006

Raaymakers, S. (2003).

'Maritime transport and high seas governance: Regulation, risks and the IMO regime'. In: *Proceedings of the International Workshop on Governance of High Seas Biodiversity Conservation*, Cairns, Australia, 17–20 June 2003. Available online at http://www.imo.org/includes/blastDataOnly.asp/data_id%3D8594/RaaymakersHighSeasPaper.pdf

Roberts, J. (2005).

'Protecting sensitive marine environments: the role and application of ships' routing measures'. *International Journal of Marine and Coastal Law*, 20:135–159.

Roberts, J. (2006a).

Marine environment protection and biodiversity conservation: The application and future development of the IMO's particularly sensitive sea area concept. Berlin, Germany: Springer.

Roberts, J. (2006b).

'Compulsory pilotage in international straits: The Torres Strait PSSA proposal'. *Ocean Development and International Law*, 37:93–112.

Roberts, J. (In press).

'The application of international measures for the protection of the marine environment from the impacts of shipping'. In: N. Oral and F. Simard (eds), *Legal mechanisms to address maritime impacts on Mediterranean biodiversity*. Gland, Switzerland and Málaga, Spain: IUCN.

Roberts, J., Workman, T., Tsamenyi, M. and Johnson, L. (2005).

'The Western European PSSA: a "politically sensitive sea area"'. *Marine Policy*, 29:431–440.

Safetec UK (1999).

Identification of the Environmental High Risk Areas (MEHRA's) in the UK. Document No. ST-8639-MI-1-Rev 01 prepared for the Department for Environment, Transport and Regions (DETR), London, UK: DETR.

Spadi, F. (2000).

'Navigation in marine protected areas: National and international law'. *Ocean Development and International Law*, 31:285–302.

Tilmant, J., Canzanelli, L., Clark, R., Curry, R., Graham, B., Mayr, M., Moulding, A., Mulcahy, R., Viehman, S. and Whittington, T. (2004).

'Restoration of coral reef habitats within the National Park system'. In: D. Harmon, B.M. Kilgore and G.E. Vietzke (eds), *Protecting our diverse heritage: The role of parks, protected areas, and cultural sites*, pp.234–239. Hancock, Michigan: The George Wright Society.

Villa, F. Tunesi, L. and Agardy, T. (2002).

'Zoning marine protected areas through spatial multiple-criteria analysis: The case of the Asinara Islands National Marine Reserve of Italy'. *Conservation Biology*, 16:515–526.

White, M. (2000).

'Navigational rights in sensitive marine environment: The Great Barrier Reef'. In: D. Rothwell and S. Bateman (eds), *Navigational rights and freedoms and the new law of the sea*, pp.230–261. The Hague, the Netherlands, and Boston, Massachusetts: Martinus Nijhoff Publishers.

WWF-Deutschland (2002).

Shipping on the Southern North Sea: What is PSSA Wadden Sea? Frankfurt-am-Main, Germany: WWF-Deutschland. Available online at http://www.waddenzee.nl/fileadmin/content/Dossiers/Overheid/pdf/PSSA_wattenmeer_wwf.pdf

10. Official Documents

IMO

Assembly Resolution A.720(17). *Guidelines for the designation of special areas and the identification of particularly sensitive sea areas*. Adopted 6 November 1991.

Assembly Resolution A.885(21). *Procedures for the identification of particularly sensitive sea areas and the adoption of associated protective measures and amendments to the guidelines contained in Resolution A.720(17)*. Adopted 25 November 1999.

Assembly Resolution A. 927(22). *Guidelines for the creation of special areas under MARPOL 73/78 and guidelines for the identification and designation of particularly sensitive sea areas*. Adopted 29 November 2001.

Assembly Resolution A.982(24). *Revised guidelines for the identification and designation of particularly sensitive sea areas*. Adopted 1 December 2005.

Circular MEPC/Circ.398. *Guidance document for submission of PSSA proposals to IMO*. 27 March 2003.

LEG/MISC/3/Rev.1. *Implications of the United Nations Convention on the Law of the Sea for the International Maritime Organization*. 6 January 2003.

LEG 87/WP.3. *West European particularly sensitive sea area (PSSA)—Comments made by the Division for Ocean Affairs and the Law of the Sea of the United Nations (DOALOS) in connection with issues raised in document LEG 87/16/1*. Submitted by DOALOS, October 2003.

MEPC 30/19/4. *Identification of particularly sensitive sea areas, including development of guidelines for designating special areas under Annexes I, II and V*. Submitted by Australia, 19 September 1990.

MEPC 33/INF.27. *Report of the international meeting of legal experts on particularly sensitive sea areas, University of Hull, 20–21 July 1992*. Submitted by the IMO Secretariat, 1 September 1992

MEPC 36/21/1. *Particularly sensitive sea areas*. Submitted by Friends of the Earth International, 29 July 1994.

MEPC 46/6/1. *Additional protection for particularly sensitive sea areas (PSSA)*. Submitted by the IMO Secretariat, 19 January 2001.

MEPC 46/6/2. *Designation of the marine area around the Florida Keys as a particularly sensitive sea area*. Submitted by the USA, 19 January 2001.

MEPC 49/8. *Extension of existing Great Barrier Reef PSSA to include the Torres Strait region*. Submitted by Australia and Papua New Guinea, 10 April 2003.

MEPC 51/8/1. *Designation of the Baltic Sea area as a particularly sensitive sea area*. Submitted by Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland and Sweden, 19 December 2003.

MEPC 53/INF.10. *Strategic Environmental Assessment: A tool to guide identification of PSSAs?* Submitted by WWF, 13 May 2005.

NAV 45/Inf.3. *Ship strikes of endangered North Atlantic right whales in the waters of eastern Canada.* Submitted by Canada, 13 July 1999.

NAV 46/3/2. *Proposed amendment to the General Provisions on Ships' Routeing to provide for a no anchoring area routeing measure.* Submitted by the USA, 5 April 2000.

NAV 48/3/5. *Amendment of the Traffic Separation Scheme in the Bay of Fundy and approaches.* Submitted by Canada, 5 April 2002.

NAV 49/3. *Routeing of ships, ship reporting and related matters: Proposed area to be avoided.* Submitted by New Zealand, 16 January 2003.

Other organizations

OSPAR Document ICG-MPA 05/8/1-E. *Legal Basis for marine protected areas on the high seas.* Submitted by A. Kirchner to the meeting of the OSPAR Commission Intersessional Correspondence Group on Marine Protected Areas (ICG-MPA), Isle of Vilm, Germany, 4–8 April 2005.

UNEP (DEPI)/ MED IG.16/13. *Mediterranean Action Plan Report of the 14th Ordinary Meeting of the Contracting Parties to the Convention for the Protection of the Marine Environment and Coastal Regions of the Mediterranean and its Protocols.* 30 November 2005.

Appendix. Summary of ships' routing measures adopted for environmental purposes since 1994⁵⁴

1. Western European waters

1.1. The region of the Berlengas Islands (Atlantic coast of Portugal)—to be protected by an area to be avoided applying to all vessels above 300 gross tonnes, except duly authorized ships navigating between Portuguese ports and not carrying dangerous cargoes or other harmful substances.

The proposal submitted to IMO noted that the uniqueness, significance and diversity of Berlenga, Farilhão and Estelas islands and adjacent waters has been recognised by the Portuguese Government under domestic legislation with the establishment of a marine reserve around the islands in 1981.

The proposal for the ATBA was submitted in 2004 (NAV 50/3/9) and adopted later that year (MSC 79/23).

2. Mediterranean Sea and Black Sea

2.1. The Adriatic Sea—protected by a ships' routing system and a mandatory ship reporting system, with the objective of enhancing the safety of navigation and the protection of the marine environment.

The proposal submitted to IMO noted that 'the protection of the Adriatic Sea is of the utmost importance for each and every country along its coast'.

The initial proposals for a SRS (NAV 47/3/4) and for routing measures (NAV 47/3/5) were submitted in 2001. Neither proposal was accepted at that time due to concerns raised by Member States.

The SRS was finally adopted in 2002 (MSC 76/23) and the routing measures, in the form of two

traffic separation schemes, a precautionary area, an area to be avoided and recommended routes, were adopted in 2004 (MSC 78/26).

2.2. The region of Cape La Nao and Cape Palos (south-east of the Iberian Peninsula, Spain)—protected by two traffic separation schemes. The proposal submitted to IMO noted that the area was 'of considerable ecological sensitivity and tourist attraction'.

The proposal for the traffic separation schemes was submitted in 2002 (NAV 48/3/6 and NAV 48/3/7) and adopted later that year (MSC 76/23).

3. Indian Ocean and adjacent waters

3.1. The Gulf of Aqaba—protected by areas to be avoided north of the Straits of Tiran, north of Sharm El Sheikh and at the southern extremity of the Sinai Peninsula respectively, in order to avoid the risk of severe damage to critical ecosystems, the environment and natural resources contained within the declared boundaries of the Ras Mohammed National Park.

First proposed in 1994 (NAV 40/4/3) and adopted in 1994 (MSC/64/22).

3.2. The southern Red Sea - protected by traffic separation schemes, recommended tracks and a precautionary area to increase maritime safety and protection of the marine area.

First proposed in July 2000 (NAV 46/3/5) and adopted in 2002 (MSC 76/23).

3.3. The region of Ra's al Kuh in the Gulf of Oman—protected by a traffic separation scheme with a view to protecting an area of considerable ecological sensitivity. First proposed in 2003 (NAV 49/3/1) and adopted in 2004 (MSC 78/26).

⁵⁴ Excludes measures adopted for the Baltic Sea, measures adopted in association with PSSAs and amendments to existing measures.

4. Australasia

4.1. The approaches to the north-east coast of the North Island of New Zealand—protected by a mandatory area to be avoided to protect a marine reserve. First proposed in 2003 (NAV 49/3) and adopted in 2004 (MSC 78/26).

5. North America, Pacific Coast

5.1. Off the Washington (USA) and British Columbia (Canada) coast, the offshore waters of the Olympic Coast National Marine Sanctuary and the Strait of Georgia—protected by an area to be avoided, new and amended traffic separation schemes and a recommended route.

Although IMO had adopted a traffic separation scheme for the Strait of Juan de Fuca in 1981, the area to be avoided was first proposed in 1994 (NAV 40/4/2) in recognition of the area's nearly pristine coastal environment and the continued survival of several ecologically and commercially important species.

The routing system was further amended in 2001 with amendments to the existing, and addition of a new, traffic separation scheme (NAV 47/3/9), the expansion of the area to be avoided (NAV 47/3/11) and the addition of a new recommended route (NAV 47/3/10).

The measures were adopted in 2002 (MSC 75/24).

5.2. The area of the California coast between Pigeon Point and Point Sur—protected by the establishment of three recommended tracks for use by certain ships. This area was designated a national marine sanctuary because of its national and international significance for biodiversity. It is described as being one of the most biologically diverse marine areas in the world.

First proposed in 1999 (NAV 45/3/4) and adopted in 2000 (MSC 72/23).

6. Western North Atlantic, Gulf of Mexico and Caribbean Sea

6.1. The Grand Banks area off the East Coast of Canada—protected by the establishment of a precautionary area around the Terra Nova floating

production, storage and offloading vessel (FPSO), to minimize the possibility of collisions and resultant environmental damage.

The Grand Banks support a highly productive ecosystem where fish, shellfish, whales, seals, seabirds and other marine life are found in large numbers. It also has a high socio-economic value and, as one of the most prolific fishing areas in the world, has sustained fishing fleets from many countries.

First proposed as an area to be avoided in March 2001 (NAV 47/3/14); following concerns raised by several delegations over the establishment of an area to be avoided around an FPSO, the application was modified to a precautionary area which was adopted in 2002 (MSC 75/24).

6.2. The area of the Bay of Fundy—provided additional protection by an amendment to the existing traffic separation scheme. The scheme was first adopted in 1982 for the purpose of organizing traffic through an area extensively used for fishing. As such, the original application was safety related. It is included in this analysis because of the amendments being proposed on the basis of environmental protection.

The amended scheme is proposed for the purpose of reducing ship strikes of the highly endangered North Atlantic right whale by shifting the traffic lanes of the TSS from an area with the highest density of right whales to an area where there is a lower density. The area is designated as a Right Whale Conservation Area.

Proposed in 2002 (NAV 48/3/5) and adopted later that year (MSC 76/23).

6.3. The regions of the north-east and south-east coast of the USA—protected by mandatory ship reporting systems, to provide beneficial information to ships to assist them in navigating safely through areas recognised as critical habitats for the North Atlantic right whale.

The system off the south-eastern coast of the United States will operate from 15 November to 15 April, which includes the calving season for right whales in this area; whilst the system off the north-eastern coast will operate throughout

the year, as right whales have been sighted in this area throughout the year.

The Northern right whale is listed internationally as endangered, and has been shown to be highly vulnerable to ship strikes. The measures will thus directly contribute to the survival and recovery of the species.

First proposed in 1998 (NAV 44/3/1) and adopted later that year (MSC 70/23).

6.4. The Flower Gardens Banks coral reef in the north-western Gulf of Mexico—protected by three mandatory no-anchoring areas to significantly prevent and reduce the risk of damage to the coral marine environment by ships, without restricting the sea area available for navigation.

The area is a National Marine Sanctuary. These areas are unique even among the world's coral

reefs. The banks contain the northernmost coral reefs on the North American continental shelf and support the most highly developed offshore hard-bank communities in the region.

First proposed in 2000 (NAV 46/3/3) and adopted later that year (MSC 73/21).

6.5. The approaches to the port of Veracruz—protected by a traffic separation scheme, an area to be avoided and precautionary areas with the aim of protecting the National Marine Park from the risk of pollution caused by the grounding of ships in the area.

The routing system was first proposed in 1993 but did not satisfy the criteria set out in the GPSR at the time. The application was subsequently resubmitted with modifications in 1995 (NAV 41/4/3; 41/4/4; 41/4/5) and finally adopted in 1996 (MSC 66/24).

Chapter 3

The application of international measures for the protection of the marine environment from the impacts of shipping

Julian P. Roberts, Ph.D.

Abbreviations and acronyms

AIS	Automatic identification system
CDEM	Construction, design, equipment and manning
COLREGS	International Regulations for the Prevention of Collisions at Sea, 1972
EEZ	Exclusive economic zone
FSI	IMO Sub-committee on Flag State Implementation
GPSR	General Provisions on Ships' Routeing
IMO	International Maritime Organization
ITOPF	International Tanker Operators Pollution Federation
MARPOL 73/78	International Convention for the Prevention of Pollution from Ships, as modified by the 1978 Protocol relating thereto
MCA	UK Maritime and Coastguard Agency
MEPC	IMO Marine Environment Protection Committee
MSC	IMO Maritime Safety Committee
NAV	IMO Sub-committee on Safety of Navigation
OECD	Organization for Economic Cooperation and Development
PSSA	Particularly sensitive sea area
SOLAS	International Convention for the Safety of Life at Sea, 1974
SRS	Ship reporting system
TSS	Traffic separation scheme
UNCLOS	United Nations Convention on the Law of the Sea, 1982
USA	United States of America
VTS	Vessel traffic services

1. Introduction

The objective of risk management is to reduce or, where possible, prevent the impacts of undesirable events. These may include damage to property or environmental impacts.

To manage risk we are generally faced with two options:

- a) Reduce the likelihood of an event occurring;
or
- b) Mitigate the consequences of that event once it has occurred.

In the context of environmental risk from shipping, the International Maritime Organization (IMO) has adopted numerous measures aimed both at reducing the likelihood of environmental damage arising from shipping operations and at mitigating the impacts of such damage should it occur. Such measures include but are not limited to: construction, design, equipment and manning (CDEM) standards for tankers and other merchant vessels; the application of ships' routing and other navigation safety measures; comprehensive survey and classification requirements for merchant vessels; and a broad range of standards regulating the discharge of oil, other harmful substances and invasive aquatic species into the marine environment.

Similarly, IMO measures dealing with the mitigation of such incidents include:

comprehensive planning and preparedness for oil and hazardous substance spills; regimes dealing with the intervention powers of states with regard to vessels in distress; and a comprehensive international compensation framework to provide financial assistance and compensation to those states that are affected by marine spills of oil and other harmful substances arising from international shipping activities.

This chapter provides an overview of the broad range of measures that may be adopted, either unilaterally by states or multilaterally through IMO, for the protection of the Mediterranean Sea from the specific environmental threats posed by international shipping.

It is beyond the scope of this chapter to address those international standards that may be enforced under international conventions. These are dealt with specifically elsewhere in this volume (Verlaan, in press). Similarly, the chapter does not deal with the particularly sensitive sea area concept, which is also the subject of an accompanying contribution (Roberts & Pullen, in press). Rather, it addresses the broad range of practical measures that states can implement, either unilaterally or multilaterally, to respond to operational threats posed by shipping to the marine environment. This chapter should therefore be read in conjunction with the other contributions to this volume.

2. Nature of the impacts of shipping

It is not the intention of this chapter to address the impacts of shipping on the marine environment in detail, since these are discussed in the accompanying volume (Abdulla & Linden, In press). However, in order to place the subsequent discussions into context, a broad appreciation by the reader of the subject is desirable. In particular it should be recognised that, although the emphasis has historically been placed on the control and impacts of ship-source oil pollution, ships can constitute an environmental hazard to the marine environment in a number of other ways, including through operational and accidental discharges and physical harm.

2.1. Operational discharges

The most common sources of ship-source pollution derive from the normal operation of a ship.⁵⁵ These so-called 'operational discharges' include certain automatic releases as well as intentional discharges incidental to normal operations. Such discharges include oil and other harmful substances, ballast water and associated invasive aquatic organisms, antifouling substances, garbage and sewage.

Since most of these sources of pollution are regulated to some degree, the extent to which such sources of pollution represent an environmental threat will depend on the degree of compliance with the relevant international conventions. Whereas international environmental law does permit certain operational discharges within

specified limits, non-compliance with these standards represents a significant ongoing problem.

2.2. Accidental discharges

Although operational discharges of oil represent by far the most significant input of oil from ships, public perception demands that accidental discharges of oil and other harmful substances receive the greatest scrutiny. Numerous high-profile maritime casualties in recent years have demonstrated the potential significant impacts such incidents may have on both the environment and the economy of coastal states. A significant literature exists on the environmental and the socio-economic impacts of such incidents.

However, the incidence of large spills is relatively low and it is clear that the number of large spills (of more than 700 tonnes) has decreased significantly during the last 30 years.⁵⁶ The average number of large spills per year during the 1990s was less than a third of that witnessed during the 1970s (ITOPF, 2005, p.9). Most incidents are the result of a combination of actions and circumstances, all of which contribute in varying degrees to the final outcome.

2.3. Physical harm

Less emphasis is generally placed on the physical damage that vessels may give rise to. However,

55 Despite catastrophic oil spills resulting from tanker accidents, the principal source of ship-source pollution remains routine operational discharges. See for example the recent report of the Organization for Economic Cooperation and Development (OECD) Maritime Transport Committee (OECD, 2003, pp.10–11). See also the estimates of oil inputs into the sea published by the US National Research Council (NRC, 2002, chapter 3 generally).

56 Data from the International Tanker Operators Pollution Federation (ITOPF) suggests that in the period 1970–1979 3.14 million tonnes of oil was spilt in tanker accidents, whereas during the period 1990–1999 less than half that volume (1.14 million tonnes) was spilt. Furthermore, a few very large spills are responsible for a high percentage of the oil spilt in any one year. Such large accidents have the potential to contribute significantly to the overall data. See <http://www.itopf.com/information-services/data-and-statistics/statistics/>

the physical impacts of shipping are becoming more and more apparent. Such impacts may include engine and machinery noise, physical

damage to organisms and habitats,⁵⁷ and wake and wash effects associated with high-speed passage in narrow channels.

57 In fragile marine environments such as coral reefs, ships may cause harm by running aground or by the use of anchors. See for example the submission made by the USA to the ILO Marine Environment Protection Committee seeking designation of the Florida Keys as a PSSA, which noted the incidence of coral damage by ship grounding and anchor use (MEPC, 2001, paras 5.1.2–5.1.3)

3. Legal basis for protection of the marine environment from damage by ships

3.1. Law of the Sea Convention

The negotiation of the United Nations Convention on the Law of the Sea (UNCLOS) has effected a number of fundamental changes in the international law of the sea. As discussed by Verlaan (in press), UNCLOS fixes international obligations for states to protect the marine environment in a number of ways. Principal among these is the fact that control of pollution from a number of sources is now seen as a primary obligation on all states. A second change is the alteration in the balance of power between flag states and coastal states with respect to the rights of the latter to regulate shipping for the purposes of protecting their coastal waters and the resources therein. Thirdly, emphasis is no longer placed on responsibility or liability for environmental damage but instead

rests primarily on international regulation and cooperation for the protection of the marine environment.

With regard to shipping, UNCLOS respects the integrity of the global navigation system and turns to IMO as the competent international organization to establish international rules and technical standards with which national laws and regulations are to conform. It also sets out an enforcement regime allocating defined powers to flag, coastal, and port states. Channelling the rules of individual states through IMO as the competent organization aims to ensure that states' rules at the national level will be fairly uniform and also correspond to international rules. Therefore, the interplay between IMO and UNCLOS is of primary importance in the international regulation of shipping.

4. Maritime jurisdiction under the law of the sea

UNCLOS attempts to create a balance between protection of the marine environment and the rights of navigation through provisions which balance the various interests, taking into account the various jurisdictional zones into which the ocean space has been divided. Although it establishes a primary obligation to protect and preserve the marine environment and to prevent, reduce and control pollution, the only obligations for ships to do so are placed on flag states. Consequently, coastal and port states have limited jurisdiction to prescribe and enforce standards.

Implementation of the various kinds of standards involves the exercise of different types of jurisdiction:

- a) *Prescriptive jurisdiction*: the jurisdiction to mandate a vessel's compliance with particular standards;
- b) *Enforcement jurisdiction*: jurisdiction to prevent or punish violations of those standards; and
- c) *Adjudicative jurisdiction*: the power of the court or administrative tribunal to hear a case against a vessel or person.

The first of these is of most relevance in the context of this chapter, particularly insofar as it relates to a coastal state's ability to prescribe standards for the purpose of environmental protection.

The existence of maritime zones is particularly important in determining how coastal state jurisdiction should be exerted in connection with the enforcement of navigation and anti-pollution standards. In general, IMO treaties do not attempt to regulate the nature and extent of coastal state jurisdiction. Thus the degree to which coastal states may enforce IMO regulations in respect of

foreign ships in innocent passage in their territorial waters, or navigating in the exclusive economic zone (EEZ), is exclusively subject to regulation by UNCLOS. The same principle applies to transit passage in straits used for international navigation or to archipelagic sea lanes.

4.1. Jurisdiction in ports and internal waters

Customary international law acknowledges in principle full coastal state jurisdiction within ports. By entering foreign ports and other internal waters, ships put themselves within the territorial jurisdiction of the coastal state (Churchill and Lowe, 1999, p.65). Coastal states therefore have extensive authority to regulate ships that enter their ports (Johnson, 2004, p.35). Based on the principle of territoriality, this jurisdiction provides a port state with the ability not only to close down its ports to international shipping but also to set port entry conditions (Johnson, 2004, p.35). Pursuant to Article 211(3) of UNCLOS, states may establish particular requirements for the prevention, reduction and control of pollution as a condition for the entry of foreign vessels into their ports. Consequently there is no right of innocent passage as exists in the territorial sea.

4.2. Jurisdiction in the territorial sea

With respect to the territorial sea, UNCLOS promotes a preference for national rules and standards to be adopted by the coastal state. Coastal states may therefore adopt their own rules on discharges for foreign vessels. However, there are two principle limitations on these powers:

- a) Ships of all states enjoy the right of innocent passage⁵⁸ through the territorial sea. UNCLOS places on coastal states an

⁵⁸ Innocent passage is broadly defined in Articles 18 and 19 of UNCLOS. For a detailed discussion of the meaning of the term see for example Molenaar (1998), pp.195–199; Hakapaa & Molenaar (1999).

obligation not to hamper, deny or impair the right of innocent passage (Smith, 1982, p. 50); and

- b) Coastal states are not permitted to establish rules and standards that relate to CDEM, unless such rules give effect to 'generally accepted international rules or standards' (UNCLOS, Article 21(2)).

Nevertheless, coastal states retain a significant degree of authority to prescribe and enforce their laws over foreign ships engaged in such passage. Thus, in its territorial sea, a coastal state may legitimately regulate innocent passage with respect to, *inter alia*:

- a) The safety of navigation and the regulation of maritime traffic;
- b) The conservation of the living resources of the sea; and
- c) The preservation of the environment of the coastal state and the prevention, reduction and control of pollution thereof (Article 21 of UNCLOS).

Article 22 of UNCLOS provides that coastal states may:

- a) Designate sea lanes and prescribe traffic separation schemes (TSS) for the regulation of innocent passage of ships through its territorial sea, where necessary, having regard to the safety of navigation; and
- b) Require tankers, nuclear-powered ships and ships carrying nuclear or other inherently dangerous or noxious substances or materials to confine their passage to such sea lanes.⁵⁹

Articles 21 and 22, when read together and in the context of Article 211(1), thus confirm that coastal states have the power to adopt routeing measures to protect vulnerable areas and can regulate the environmental impacts of international shipping.

The situation in the territorial sea is thus a compromise between the coastal state's powers to control navigation and pollution on the one hand, and the rights of innocent passage and international control of construction, design, equipment and manning of vessels on the other (Boyle, 1985, p. 360).

4.3. Jurisdiction in the EEZ

Coastal states' rights and jurisdiction in the EEZ relate to the natural resources of the EEZ. Article 56(1)(a) of UNCLOS provides that states have, *inter alia*, sovereign rights for the purpose of exploring and exploiting, conserving and managing the natural resources, whether living or non-living, of the waters superadjacent to the seabed and of the seabed and its subsoil.

Subject to Part XII of UNCLOS, coastal states have the legislative and enforcement competence in the EEZ to deal with, *inter alia*, pollution from vessels. Within the EEZ, coastal states may adopt laws and regulations applicable to foreign-flag vessels, but those laws must conform to 'generally accepted international rules and standards established through the competent international organization or general diplomatic conference'.

These rights notwithstanding, Article 58(1) of UNCLOS specifically provides that ships enjoy freedom of navigation in the EEZ. Consequently, coastal states are not generally permitted to prescribe navigational standards within the EEZ, except in certain circumstances. While UNCLOS does not specifically give competence to coastal states to adopt routeing measures in their EEZ in any way analogous to those provisions for the territorial sea, nevertheless, pursuant to the provisions of Article 211(1) and with the consent of IMO, a coastal state may still legitimately impose controls on navigation in the form of routeing measures. Furthermore, out of deference to its interests in conserving and managing resources, the coastal state is allowed to establish environmental standards that may be more stringent than those internationally established. These measures are characterized as 'special

⁵⁹ The subject of coastal state rights with respect to ships carrying hazardous cargoes has attracted a great deal of attention in recent times. High-profile incidents such as the *Prestige* and the *Erika* have prompted several coastal states to propose increasingly stringent measures to protect their coastal waters. See for example Roberts *et al.* (2005).

mandatory measures' aimed at preventing vessel-source pollution in the EEZ. This authority is not unilateral, however, and a coastal state must submit a proposal for such measures to IMO for its approval.

It is a traditionally held view that the establishment of routing measures for the purpose of protecting the marine environment must relate to pollution.⁶⁰ Thus, in the context of Article 56 and other provisions of Part V of UNCLOS, a coastal state must tie adverse effects from ship-source pollution to its EEZ resources in order to make the case for imposition of environmental rules and standards. However, what if a coastal state's concerns relate to environmental impacts other than pollution? In a detailed discussion of this issue, Johnson argues that states exercising their sovereign rights under Part V of UNCLOS may adopt measures for the purpose of protection and preservation of the marine environment and for conserving and managing natural resources (Johnson, 2004, pp.103–106). Hence, coastal states may seek to establish navigational controls for impacts to EEZ resources that are not directly associated with pollution (Roberts, 2005, p.139). It thus follows logically that, in order to give effect to the obligations under Article 56 (as well as Articles 192 and 194(5)), IMO may similarly adopt measures for the purposes of protection and preservation of the marine environment and for conserving and managing natural resources.

The USA has taken this position, claiming jurisdiction to protect biological resources, within its sovereign jurisdiction, from non-pollution-related impacts of international shipping. For example, the USA successfully argued for an amendment to the General Provisions on Ships' Routing (GPSR) to include no-anchoring areas as a recognised ships' routing measure. Clearly anchor damage is not 'pollution' *per se*, but the USA argued that 'there is clearly a need to establish a measure for no anchoring areas in the GPSR. Such areas could be proposed and established

where anchoring may be unsafe, unstable, hazardous, or where there is the possibility that unacceptable damage to the marine environment would result' (NAV 46/3/2, 2000).

On the basis that this argument would be accepted, the USA also proposed the establishment of three mandatory no-anchoring areas to protect the coral reefs of the Flower Garden Banks in the Gulf of Mexico (NAV 46/3/3, 2000). Subsequently, the USA sought the adoption of three mandatory no-anchoring areas as an integral part of a proposal to identify the marine area around the Florida Keys as a PSSA (NAV 47/3/1, 2001).

This approach has also been applied to the protection of North Atlantic right whales off the east coast of the USA. Two mandatory ship reporting schemes were adopted by IMO in 1998, in order to 'provide important protection for endangered large whale species, in particular the critically endangered northern right whale' (NAV 44/14, 1998, Annex 8, para. 1). Similarly, Canada has also amended a traffic separation scheme (TSS) in the Bay of Fundy for the purpose of reducing ship strikes on North Atlantic right whales, by shifting the traffic lanes of the TSS from an area with the highest density of right whales to an area where there is a lower density (NAV 48/3/5, 2002; MSC 76/23, 2002, para. 113).

4.4. Straits used for international navigation

The regime dealing with navigation through international straits is found in Part III of UNCLOS. While UNCLOS does not define the term 'strait', the ordinary meaning of a strait as 'a natural passage or arm of water connecting two larger bodies of water' appears to be accepted. Straits may comprise internal waters, territorial seas, exclusive economic zones, and even areas of the high seas. What is important, therefore, is the legal status of the waters constituting a strait, as it is this factor that determines the navigational rights of other states through a strait.

60 It is reasoned that Article 56 is subject to the requirements of Article 211(5), which restricts coastal States' rights to regulate ships transiting the EEZ, and stipulates that measures established in the EEZ for the prevention, reduction and control of pollution from vessels must conform to, and give effect to, generally accepted international rules and standards established through the IMO.

Part III of UNCLOS recognises four types of passage through international straits:

- a) The right of ‘transit passage’ through straits used for international navigation which connect one part of the high seas or an exclusive economic zone with another part of the high seas or an exclusive economic zone;
- b) ‘Innocent passage’ through straits used for international navigation formed by the mainland and an island of the state bordering the strait where there exists to seaward route through the high seas or a route of similar convenience;
- c) Normal freedoms of navigation and overflight as prescribed in UNCLOS in straits used for international navigation, through which there exists a high seas or exclusive economic zone corridor; and
- d) The legal regime in straits created by previously negotiated, long-standing international conventions regarding passage by shipping through those straits, which conventions are not affected by Part III of UNCLOS.

4.4.1. The transit passage regime

The transit passage regime implies, as regards navigation, that the strait is no longer to be considered part of the territorial sea of a strait state and that coastal state powers in the strait are different from those it can exercise in the territorial sea. Thus, in a strait where the transit passage regime exists, the rules of innocent passage are supplanted by the more relaxed rules of transit passage. The transit passage regime has been described as sitting somewhere between the regime of ‘innocent passage’ and ‘free navigation’. Ships in transit passage are also obliged to comply with ‘generally accepted international regulations, procedures and practices’ for safety at sea and the prevention, reduction and control of pollution from ships. Thus, standards set out in the International Convention for the Safety of Life at Sea, 1974 (SOLAS), the Convention on the International Regulations for the Prevention of Collisions at

Sea, 1972 (COLREGS) and the International Convention for the Prevention of Pollution from Ships 1973 as modified by the Protocol of 1978 relating thereto (MARPOL 73/78), for example, would be applicable to all ships in the strait irrespective of whether the flag state was a party to those conventions. Ships in straits used for international navigation which are not exercising their right of transit passage are subject to the general provisions of UNCLOS other than those in Part III.

4.4.2. Coastal state jurisdiction to regulate transit passage

The regime of transit passage generally applies in areas where there is no equally convenient alternative route or in some cases no alternative route at all. As a result, interference with navigation in these areas may be a serious problem and, unlike the innocent passage regime of the territorial sea, strait states have no unilateral regulatory powers to impose routing measures on ships in transit passage. However, while a coastal state’s regulatory powers in international straits are limited by the provisions of Part III of UNCLOS, a coastal state may still impose controls on navigation.

Strait states may adopt laws and regulations relating to transit passage, *inter alia* with respect to the safety of navigation and maritime traffic and the prevention and control of pollution. Pursuant to Article 41 of UNCLOS, strait states have the right to prescribe sea lanes and traffic separation schemes to minimize the number of accidents and to enhance the safety of navigation, provided they conform to international regulations and are submitted to IMO for adoption.

4.4.3. Innocent passage in international straits

Innocent passage applies to those straits used for international navigation which are excluded from the regime of transit passage or which are between a part of the high seas or an EEZ and the territorial sea of a foreign state. The innocent passage regime is set forth in Part II of UNCLOS and is discussed above in the context of coastal jurisdiction in the territorial sea. However, in the context of the international straits regime, such innocent passage is not suspendable.

5. Prevention of damage from shipping

A number of IMO measures respond to the need to prevent environmental damage. While it is not an exhaustive analysis, the following discussion highlights those measures that are currently available and most often applied through various IMO instruments.

5.1. Special discharge restrictions

Under MARPOL 73/78, all sea areas are protected to some degree from the discharge of harmful substances. Most sea areas have a level of protection that is considered adequate. However, where additional protection is deemed necessary, MARPOL 73/78 provides for the designation of Special Areas and imposes correspondingly more stringent restrictions on the discharge of harmful substances. Special areas are provided for in three of the six MARPOL Annexes currently in force.⁶¹ To date, a total of 11 Special Areas have been designated under the three Annexes (Table 3.1).

While each Annex has slightly different wording, the definition in Annex I reflects the general intent of what a Special Area is: ‘A sea area where, for recognised technical reasons in relation to its oceanographic and ecological condition and to the particular character of its traffic, the adoption of special mandatory methods for the prevention of sea pollution by oil is required.’

Therefore, under MARPOL 73/78, Special Areas are afforded a higher level of protection than other marine areas. For example, according to MARPOL Annex I, the discharge of oil from oil tankers and from other ships of 400 gross tonnes and above is wholly prohibited. While in such areas, ships shall retain on board all oil drainage and sludge, dirty ballast, and tank washing waters, and then discharge them only to reception facilities.

A Special Area may encompass the maritime zone of several states, or even an entire enclosed

Table 3.1 – Special Areas designated under Annexes I, II and V of MARPOL 73/78

Annex I	Annex II	Annex V
Mediterranean Sea area	Baltic Sea area	Mediterranean Sea area
Baltic Sea area	Black Sea area	Baltic Sea area
Black Sea area	Antarctic area	Black Sea area
Red Sea area		Red Sea area
Gulfs area		Gulfs area
Gulf of Aden		North Sea area
Antarctic area		Antarctic area
North West European waters		Wider Caribbean area
Oman area of the Arabian Sea		
Southern South African waters		

⁶¹ Annexes I, II and V of MARPOL 73/78 provide for Special Areas to be designated in respect of the discharge of oil, noxious liquid substances, and garbage, respectively. In addition, Annex VI of MARPOL 73/78 provides for a type of Special Area called a SO_x Emission Control Area (SECA) which deals exclusively with discharges to air (Regulation 14 of Annex VI). To date, only the Baltic Sea area and the North Sea area have been designated as SECAs.

or semi-enclosed area.⁶² Special Area designation must be made on the basis of the criteria and characteristics set out in IMO's Guidelines for the Designation of Special Areas (IMO Resolution A.927(22), 2001, Annex I). Other considerations may also be taken into account, including the threat to amenities posed by non-maritime sources of pollution such as land-based sources, dumping of waste and atmospheric deposition (Wonham, 1992, p. 365). In addition to meeting the criteria set out in the Special Area Guidelines, the requirements of a Special Area can only become effective when adequate reception facilities have been provided, in accordance with the provisions of MARPOL 73/78.⁶³ This requirement for adequate reception facilities has delayed the coming into force of several Special Areas.

5.1.1. Reception facilities

IMO has clearly emphasised the importance of adequate reception facilities in the chain of implementation of MARPOL 73/78, and stated that the policy of 'zero tolerance of illegal discharges from ships' could only be effectively enforced when there were adequate reception facilities in ports. IMO thus recognises that provision of reception facilities is crucial for effective MARPOL implementation, and the Marine Environment Protection Committee (MEPC) has strongly encouraged Member states, particularly those Parties to MARPOL 73/78, to fulfil their treaty obligations on providing adequate reception facilities.

More recently MEPC approved an Action Plan to tackle the alleged inadequacy of port reception facilities—seen as a major hurdle to overcome in order to achieve full compliance with MARPOL. The Plan was developed by the Sub-committee on Flag State Implementation (FSI), and it is hoped

that its outcome will contribute to the effective implementation of MARPOL 73/78 and promote quality and environmental consciousness among administrations and shipping.

5.1.2. Ship-to-ship oil transfers

With increasing frequency, maritime shipping is engaging in the transfer of oil and other harmful substances between vessels coming alongside each other outside harbour limits or beyond the jurisdiction of the nearest states.

The matter is as yet unregulated outside national jurisdiction but it is a relevant issue with respect to the Mediterranean since this activity does occur within the region. As noted in a submission to IMO,⁶⁴ Spain has found the activity occurring off its coast where tankers remain outside the waters of its harbours operating continuously as oil supply terminals. The practices also take place outside Spain's territorial sea but still relatively near to its coast. The activity, while unregulated, does present a potential threat of pollution during the inter-ship oil transfer or supply operations.

5.2. Regulation of navigation for protection of the environment

It is widely acknowledged that protection of the environment is a secondary benefit of the enhancement of navigational safety,⁶⁵ since measures for the security of maritime traffic usually prevent environmental hazards as well. However, international and national state practice has evolved to recognise the legitimacy of using navigation measures for the primary purpose of protecting the marine environment from pollution and other damage from ships.⁶⁶ This is particularly true in the case of PSSAs. While the

62 Examples of such areas include the Baltic, Black and Mediterranean Seas.

63 Special Area Guidelines (IMO Resolution A.927(22), 2001, Annex I), para. 2.7. The Antarctic has been treated differently, since wastes must be kept on board until ships have left the area.

64 A joint proposal was submitted by Spain and Mexico seeking the potential for examining the case for amending Annex I of MARPOL 73/78 in respect of the potential risk to the marine environment posed by transfers of oil cargoes between ships on the high seas (MEPC 53/20, 2004). As a result of this submission, the Committee agreed to consider the development of amendments to MARPOL 73/78 to prevent the risk of pollution during oil transfer operations between ships at sea.

65 See for example the report of the Lord Donaldson Inquiry into the sinking of the *MV Braer* in 1993, which concluded that: 'pollution control and safety are very closely linked, because the best way to maintain safety and to prevent pollution is to preserve the integrity of the ship' (HMSO, 1994, para. 1.11).

66 For an overview of the application of ships routing measures for environmental purposes see Roberts (2005) generally.

most commonly used type of measure for this purpose are ships' routing measures, it is also recognised that ship reporting systems (SRS) and vessel traffic services (VTS) may contribute to the protection of the marine environment (see Plant, 1997, for a general discussion on this issue).

Whereas IMO instruments do not attempt to regulate the jurisdictional power of the coastal state, specific competences for the regulation of navigational safety are attributed to IMO by a range of international instruments. These competences and the range of measures available to regulate navigation for environmental purposes are discussed below.

5.2.1. Ships' routing measures

SOLAS recognises IMO as the only body having authority for establishing and adopting routing measures at an international level, while COLREGS provide specifically for the adoption of TSS.⁶⁷ This competence is supplemented by IMO's General Provisions on Ships' Routing (GPSR) (Ilstra, 1989, p. 219). The GPSR recognise the following as true ships' routing measures: traffic separation schemes, two-way routes, recommended tracks, areas to be avoided, no-anchoring areas, inshore traffic zones, roundabouts, precautionary areas, and deepwater routes.

While vessel routing measures have been used in the protection of the marine environment for many years, the explicit application of such tools for this purpose has only been formally recognised by IMO within the last decade, a development which is largely attributable to the establishment of the PSSA concept.

The GPSR contain a specific procedure to address the adoption of routing systems intended to protect an environmentally sensitive area, as follows:

In deciding whether or not to adopt or amend a routing system which is intended to protect the marine environment, IMO will consider:

- a) whether the proposed routing system can reasonably be expected to prevent or significantly reduce the risk of pollution or other damage to the marine environment of the area concerned;
- b) whether, given the overall size of the area to be protected or aggregate number of environmentally sensitive areas established or identified in the geographical region concerned, the use of the routing systems—particularly areas to be avoided—could have the effect of unreasonably limiting the sea area available for navigation; and
- c) whether the proposed routing system meets the requirements of IMO's General Provisions.

Regulation 10 of Chapter V of SOLAS also reflects the potential application of vessel routing measures to protect the environment.

Traffic separation schemes and other ship routing systems have now been established in most of the major congested shipping areas of the world, and the number of collisions and groundings has often been dramatically reduced. A broad range of routing measures has also been adopted by IMO explicitly for the purpose of protection of the marine environment. Some of these are highlighted in the Appendix to the previous background chapter on PSSAs (Roberts & Pullen, in press). Furthermore, as noted in section 4.3 above, new types of routing measure have been specifically adopted by IMO to respond to environmental concerns.

5.2.2. Status of routing measures

One important consideration that needs to be taken into account when developing proposals for new routing measures is whether such measures should be mandatory or recommended in nature. While coastal states are entitled to establish and enforce mandatory domestic ships' routing measures within their territorial sea, the concept

⁶⁷ Rule 10 of COLREGS deals with the behaviour of vessels in or near traffic separation schemes adopted by the Organization.

of mandatory routing systems is a fairly recent development at IMO. Until 1997, only traffic separation schemes, but not the other routing measures adopted under SOLAS, could be made mandatory. However, pursuant to amendments to SOLAS, IMO may now adopt any ships' routing measure as mandatory in appropriate cases.

Paragraph 1 of SOLAS Regulation V/10 states that: 'Ships' routing systems are recommended for use by, and may be made mandatory for, all ships, certain categories of ships, or ships carrying certain cargoes, when adopted and implemented in accordance with the guidelines and criteria developed by the Organization' (emphasis added).

Furthermore, Paragraph 7 of Regulation V/10 states that: 'A ship shall use a mandatory ships' routing system adopted by the Organization as required for its category or cargo carried and in accordance with the relevant provisions in force unless there are compelling reasons not to use a particular ships' routing system' (emphasis added).

The concept of mandatory versus recommended routing measures was also considered by the Donaldson Inquiry, which concluded, *inter alia*, that provision of clear explanations of why particular guidance was being given was more likely to deliver high levels of compliance than the imposition of a mandatory rule that could not be enforced (HMSO, 1994, paras 14.92–14.94). While the inquiry was not convinced of the benefits of mandatory schemes in general, it did concede that certain areas may benefit from special protection in the form of elimination of traffic (Warren & Wallace, 1994, p.528).

The Donaldson Inquiry acknowledged that it was difficult to ascertain the extent to which ships' masters heed IMO-endorsed advice, although based on their own research they

concluded that masters routinely follow advice printed on charts without considering whether it is 'voluntary' or 'mandatory' (HMSO, 1994, para. 14.92). Nevertheless, experience from both New Zealand⁶⁸ and Australia⁶⁹ does suggest that mandatory status for a routing measure has the ability to achieve a higher level of compliance with that measure, thereby providing a greater degree of protection to the area in question. The question is also important from an enforcement and compliance perspective, since only mandatory measures can be enforced internationally beyond the territorial sea.

IMO will not adopt a proposed routing measure until it is satisfied that the proposed system will not impose unnecessary constraints on shipping and it is completely in accordance with the requirements of SOLAS and the GPSR. In particular, an area to be avoided will not be adopted if it would impede the passage of ships through an international strait. When determining areas to be avoided for all ships or certain classes of ships, the necessity for creating such areas should be well demonstrated (GPSR, para. 5.6). The recent example of Sweden attempting to secure a mandatory area to be avoided in its EEZ highlights IMO's reluctance to adopt such a restrictive measure.⁷⁰

5.2.3. Benefits of IMO approval

While coastal states are entitled to establish vessel routing systems unilaterally within their territorial waters, subject to the requirement not to hamper innocent passage, it is widely acknowledged that approval by IMO is desirable, if not necessary. Paragraph 3.16 of the GPSR recommends that governments establishing routing systems entirely within their territorial sea should designate them in accordance with the criteria established by IMO and submit them to IMO for adoption. Routing measures adopted through IMO are more likely to be observed by international

68 Author's own experience as environmental advisor to the New Zealand Maritime Safety Authority.

69 The Great Barrier Marine Park amended its zoning plans to restrict ship traffic because previously implemented ships' routing measures had failed to address the threat posed by shipping transiting the inner route of the Great Barrier Reef.

70 In the case of the Baltic Sea PSSA proposal, the proponents put forward a number of associated protective measures, including two areas to be avoided. It was argued that the areas to be avoided should be mandatory on account of the environmental significance of the area to be protected. The NAV Sub-committee expressed the opinion that the PSSA proposal did not justify the establishment of mandatory areas to be avoided, preferring instead to approve non-mandatory (recommended) areas to be avoided in both cases. See NAV 51/19 (2005), para. 3.50.

shipping. Therefore the establishment of routing systems is best conducted through IMO (Plant, 1995, p.464). Furthermore, schemes not adopted by IMO will not be published in the Ships' Routing Manual (IMO, 2003), and consequently there is no guarantee that the scheme will be known to vessels sailing the waters in which the scheme lies.

5.2.4. Vessel Traffic Services (VTS)

VTS Systems⁷¹ are shore-based systems, which range from the provision of simple information messages to ships, such as position of other traffic or meteorological hazard warnings, to extensive management of traffic within a port or waterway. However, a clear distinction must be made between a port or harbour VTS and a coastal VTS. A port VTS is mainly concerned with vessel traffic to and from a port or harbour, while a coastal VTS is mainly concerned with vessel traffic passing through an area. In the context of environmental protection, it is the establishment of a coastal VTS that is of most benefit to the protection of that area. VTS can improve safety and efficiency of navigation and protect the environment by providing interactive management of traffic along a coastline or in other sensitive areas. This could include, for example, monitoring and controlling the passage of ships carrying hazardous cargoes through or around a specific area. Generally, ships entering a VTS area report to the authorities, usually by radio, and may be tracked by the VTS control centre.⁷²

The purpose of VTS is to provide active monitoring and navigational advice for vessels in particularly

confined and busy waterways. There are two main types of VTS; surveilled and non-surveilled (US Coast Guard, 2008). Surveilled systems consist of one or more land-based sensors (i.e., radar, Automatic Identification Systems (AIS)⁷³ and closed-circuit television sites), which output their signals to a central location, where operators monitor and manage vessel traffic movement. Non-surveilled systems consist of one or more reporting points, at which ships are required to report their identity, course, speed, and other data to the monitoring authority. They encompass a wide range of techniques and capabilities, aimed at preventing vessel collisions and groundings in the harbour, harbour approach and inland waterway phase of navigation. They are also designed to expedite ship movements, increase transportation system efficiency, and improve all-weather operating capability (US Coast Guard, 2008). The efficiency of a VTS will depend on the reliability and continuity of communications, and the ability to provide clear and understandable information. The quality of accident-prevention measures will depend on the system's ability to detect a developing dangerous situation and on its ability to give timely warnings of such dangers.

The value of VTS in navigation safety and protection of the marine environment is recognised in the IMO Guidelines for Vessel Traffic Services (VTS Guidelines: IMO Resolution A.857(20), 1997). The VTS Guidelines note that a VTS is particularly appropriate in areas that include such characteristics as high traffic density, traffic carrying hazardous cargoes, conflicting and complex navigational patterns, navigational

71 A basic summary of VTS is also provided on the IMO website http://www.imo.org/Safety/mainframe.asp?topic_id=387

72 VHF-FM communications network forms the basis of most major services. Transiting vessels make position reports to a vessel traffic centre by radiotelephone and are in turn provided with accurate, complete and timely navigational safety information. The addition of a network of radars and close circuit television cameras for surveillance and computer-assisted tracking, similar to that used in air traffic control, allows the VTS to play a more significant role in marine traffic management, thereby decreasing vessel congestion, critical encounter situations, and the probability of a marine casualty resulting in environmental damage.

73 AIS is a shipboard broadcast transponder system operating in the VHF maritime band that is capable of sending and receiving ship information such as identification, position, heading, speed, ship length, beam, type, draft and hazardous cargo information, to other ships and to shore. Pursuant to Regulation 19 of SOLAS Chapter V all ships of 300 gross tonnage and upwards engaged on international voyages, cargo ships of 500 gross tonnage and upwards not engaged on international voyages and all passenger ships irrespective of size are required to carry AIS capable of providing information about the ship to other ships and to coastal authorities automatically. As a result of amendments to SOLAS brought about by the entry into force of the International Ship and Port Facility Security Code (ISPS Code), ships fitted with AIS shall maintain AIS in operation at all times except where international agreements, rules or standards provide for the protection of navigational information. See IMO Circular SN/Circ.227 (2003); Reference T2/8.02; IMO Resolution A.917(22) (2001); International Ship and Port Facility Security Code, adopted 12 December 2002, in force 1 July 2004; SOLAS/CONF.5/32 (2002); SOLAS/CONF.5/34 (2002).

difficulties, narrow channels, difficult hydrological and meteorological elements, or environmental sensitivity. These Guidelines are associated with SOLAS Regulation V/12 and, together with the Annexes to Resolution A.857(20), set out the objectives of VTS, outline the responsibilities and liability of the governments involved and give guidance for planning and implementing a VTS.

SOLAS Regulation 12 (Vessel Traffic Services) states *inter alia* that:

- a) VTS contribute to safety of life at sea, safety and efficiency of navigation, and protection of the marine environment, adjacent shore areas, work sites and offshore installations from possible adverse effects of maritime traffic.
- b) Contracting governments undertake to arrange for the establishment of VTS where, in their opinion, the volume of traffic or the degree of risk justifies such services.
- c) Contracting governments planning and implementing VTS shall, wherever possible, follow the guidelines developed by the Organization. The use of VTS may only be made mandatory in sea areas within the territorial seas of a coastal state.⁷⁴
- d) Contracting governments shall endeavour to secure the participation in, and compliance with, the provisions of vessel traffic services by ships entitled to fly their flag.

Despite the benefits of VTS in assisting in navigational safety and environmental protection, the IMO VTS Guidelines make it clear that decisions concerning the actual navigation and manoeuvring of a vessel remain solely with the master. The VTS Guidelines also highlight the importance of pilotage in a VTS and reporting procedures for ships passing through an area where a VTS operates. The use of pilotage services in areas

where traffic is heavy or navigation particularly hazardous can have clear benefits in terms of risk reduction. Accordingly, IMO has approved a number of pilotage services worldwide, including many in environmentally sensitive areas (Table 3.2).

5.2.5. Ship Reporting Systems (SRS)

Ship Reporting Systems aim to give coastal states notice of the presence, in a designated zone of adjacent waters, of all or specified categories of vessels. A SRS may apply to transiting traffic as well as vessels entering a port. A typical system may require the reporting of the vessel name, radio call sign, position, course, speed (and any additional information relevant to its purpose) to a coastal station when entering or departing the zone (Plant, 1997, p.18).

SRS are also recognised as contributing to the protection of the marine environment,⁷⁵ the major contribution of such a measure being to serve as a mechanism for notifying coastal states of the presence of ships that may present a threat. In this way, coastal states may respond more effectively in the event that such a vessel becomes distressed. If a ship leaves its planned course, or if circumstances point to a risk of collision or grounding, the coastal state can then give a timely warning or take other action deemed appropriate. It can also further help to control the passage of vessels that by their nature pose more risk to the environment than others, such as those carrying potentially polluting cargoes. Interactive reporting between a shore-based authority and a ship enables a coastal state to determine the intended movement of a ship through an area, any operational defects or difficulties affecting the ship and the nature of any hazardous cargo. This also enables the shore-based authority to determine precise details of any hazardous cargoes in the event of an emergency or threat to the environment.

Despite these benefits, a SRS does not permit the routing of vessels away from sensitive areas

74 IMO Resolution A.857(20) (1997), para. 2.2.2, also notes that a contracting government, in planning and establishing a VTS, should ensure that a legal basis for the operation of a VTS is provided for and that the VTS is operated in accordance with national and international law.

75 SOLAS, Regulation V/11 states that: 'Ships' reporting systems contribute to the safety of life at sea and efficiency of navigation and/or protection of the marine environment.'

in the same manner as a ships' routing system. However, the innovative application of such a measure may well contribute to the protection of the marine environment in specific circumstances, by providing mariners with information about particular environmental conditions.

For example, the establishment of a SRS may enable a coastal authority to warn a ship of environmental or other hazards, and of the need to take special care if passing through an area where there are critical environmental interests to be protected. At the same time, the authority can identify such things as the identity of a vessel, its intended movement and next port of call, speed, and the general categories of any hazardous cargoes on board (such as oil, noxious liquid substances, radioactive materials). As noted in section 4.3 above, SRS have also been applied off the east coast of the USA (NAV 44/14, 1998) and Canada (NAV 48/3/5, 2002) for the protection of North Atlantic right whales. Therefore, in conjunction with ships' routing systems, a SRS

may contribute to the overall protection of a given area.

By virtue of amendments to SOLAS, reporting systems may now also be voluntary or mandatory. The IMO SRS Guidelines set forth guidelines for voluntary systems and criteria for mandatory systems. Mandatory systems must be adopted by MSC and implemented in conformity with the IMO SRS Guidelines. There are now a number of areas throughout the world where mandatory reporting is required. Australia, for example, has two reporting systems: the Australian Ship Reporting System (AUSREP) and the Torres Strait and Great Barrier Reef (Inner Route) Ship Reporting System (REEFREP, part of REEFVTS). The latter system covers the Torres Strait and Great Barrier Reef, while the AUSREP system covers the western and southern approaches to the continent, as well as most of the Australian coastline (AMSA, 2005; 2006). Similarly, the SRS implemented by the USA for protection of right whales are mandatory in nature (NAV 44/14, 1998, Annex 8, para 1).

Table 3.2—IMO Resolutions encouraging the use of ships' pilots in certain areas

Resolution	Details of pilotage regime
A.480(IX) (adopted 1975) A.620(15) (adopted 1987)	The first recommends the use of qualified deep-sea pilots in the Baltic and the second recommends that ships with a draught of 13 metres or more should use the pilotage services established by coastal states in the entrances to the Baltic Sea
A.486(XII) (adopted 1981)	Recommends the use of deep-sea pilots in the North Sea, English Channel and Skagerrak
A.579(14) (adopted 1985)	Recommends that certain oil tankers, all chemical carriers and gas carriers and ships carrying radioactive material using the Sound (which separates Sweden and Denmark) should use pilotage services
A.668(16) (adopted 1989)	Recommends the use of pilotage services in the Euro-Channel and IJ-Channel (in the Netherlands)
A.710(17) (adopted 1991)	Recommends ships of over 70 metres in length and all loaded oil tankers, chemical tankers or liquefied gas carriers, irrespective of size, in the area of the Torres Strait and Great North East Channel, off Australia, to use pilotage services
A.827(19) on Ships' Routing (adopted 1995)	Includes in Annex 2 (Rules and Recommendations on Navigation through the Strait of Istanbul, the Strait of Canakkale and the Marmara Sea) the recommendation that: 'Masters of vessels passing through the Straits are strongly recommended to avail themselves of the services of a qualified pilot in order to comply with the requirements of safe navigation.'
MEPC.133(53) (adopted 2005)	Extends the existing system of pilotage within the Great Barrier Reef to include the Torres Strait

6. Mitigation of environmental damage

Once damage to the environment has occurred, or in situations where such damage may be imminent, a range of actions may be applicable as mitigation measures. Pre-eminent among these are comprehensive arrangements to respond to accidental spills of oil and other hazardous substances from ships.

6.1. Marine oil spill preparedness and response

Oil spill preparedness and response are separate but linked issues and in an ideal world both preparation and response activities will be given equal consideration. In reality preparedness activity is often given relatively little attention in countries with limited capacity and resources. Thus oil spill response becomes the primary activity for dealing with spills in countries that remain relatively under-prepared. Given the unpredictable nature of oil spills, governments have largely accepted the need for their active participation in responding to major oil spills. Oil spills that affect coastal communities are often complex and only governments have the authority to resolve contentious issues and implement an agreed policy for spill response (Moller, 1997, p.2).

In many countries, industry and governments cooperate in spill response through a tiered response approach, which creates the opportunity for escalating a response by calling on supplementary resources. Typically, Tier 1 spill response capabilities are funded and supported by industry and complement the arrangements of governments (Tiers 2 and 3), thereby providing a joint capability for dealing with larger spills. The industry also has supplemental arrangements for augmenting local and national response capabilities from larger global stockpiles (Tier 3).

To facilitate and harmonize such arrangements, IMO has developed a regulatory framework and a comprehensive set of technical guides to assist

states in establishing such preparedness and response arrangements.

6.1.1. Existing international pollution preparedness and response framework

The International Convention on Oil Pollution Preparedness, Response and Co-operation, 1990 (OPRC Convention) was adopted in 1990 and entered into force in 1995. The Convention provides an international framework for cooperation in combating and responding to major incidents or threats of oil pollution. As such, the Convention strives to:

- a) prevent marine pollution by oil, in accordance with the precautionary principle;
- b) advance the adoption of adequate response measures in the event that oil pollution does occur; and
- c) provide for mutual assistance and cooperation between states for these aims.

The Convention calls upon parties:

- a) to establish measures for dealing with pollution incidents, either nationally or at a regional and global level, in cooperation with other countries;
- b) to establish stockpiles of oil-spill combating equipment;
- c) to conduct oil-spill combating exercises; and
- d) to develop detailed plans for dealing with pollution incidents.

Ships are further required to report incidents of pollution to coastal authorities. Parties must require that ships, offshore units, and seaports

under their jurisdiction have oil pollution emergency plans.

Recognising the importance of international cooperation in combating the dangers of marine oil pollution, the Convention encourages all parties to enter into bilateral and regional response agreements to prepare for, and respond to, oil spills. The Convention establishes a voluntary mechanism for parties to provide technical assistance in the form of equipment and training to other parties that request such assistance.

Thus a key benefit of becoming a party to the OPRC Convention is the ability for states to call upon and contribute to the international framework of mutual international assistance and technical cooperation for marine oil spill preparedness and response.

To augment these arrangements, IMO adopted the HNS Protocol in March 2000. The Protocol follows the principles of the parent convention and, like the OPRC Convention, the HNS Protocol aims to provide a global framework for international cooperation in combating major incidents or threats of marine pollution arising from ships, port facilities and transfer sites.

6.1.2. National oil spill preparedness and planning

It is logical that the development of oil spill response capabilities will be related to the likelihood of spills occurring, as well as to the damage that might ensue. A risk analysis is usually the first step in the process of selecting resources and deciding where personnel, equipment and materials should be based (Moller, 1997, p.3). High-risk areas are generally found where a high oil transportation volume coincides with dense traffic and/or other navigational hazards such as shallow water, bad weather and severe conditions. The Mediterranean is such an area.

It is beyond the scope of this document to cover the full range of matters that states should address when establishing such preparedness and response arrangements. Suffice it to say that such arrangements should be commensurate with the level of risk the state is exposed to and should include as a minimum:

- a) a designated national body with authority for coordinating and responding to such incidents;
- b) a national marine oil spill (and hazardous substances) contingency plan;
- c) appropriate levels of equipment and trained personnel;
- d) regular exercising both of plans and procedures and of personnel;
- e) reciprocal arrangements with other states in the region to address large and transboundary incidents.

In reviewing the adequacy of a state's preparedness and response arrangements, there are several pertinent questions that should be asked. In all situations, the responses to the questions should be evaluated against the results of an oil spill risk assessment, and should be based on the thresholds and efficiencies agreed to by all stakeholders.

- a) Has there been a realistic assessment of the probable type and size of spill that could occur and the resources that could be affected? Has the state considered the likely movement and fate of spilled oil?
- b) Have priorities for protection been identified and agreed, keeping in mind that different mitigation options may change which resources are affected?
- c) Have protection and clean-up strategies been agreed on or discounted?
- d) Have the responsibilities of all those likely to be involved been clearly specified, and are those likely to be involved aware of and available to do what is expected?
- e) Is there sufficient equipment, materials, and labour to deal with the anticipated spill, and are back-up resources identified and available if needed?
- f) Is the response equipment appropriately located and maintained, and are responders trained and available to use it?

- g) Are initial notification and evaluation procedures clearly stated, robust, and tested?
- h) Are arrangements in place for the continual review of clean-up progress and effectiveness?
- i) Are there effective arrangements for communication between land, sea, and air?
- j) Have all aspects of the contingency plan been tested and deficiencies rectified?
- k) Is the plan compatible with plans for adjacent areas and activities?

6.2. Places of refuge

It has been a long-established law of the sea principle that foreign ships in distress may seek safe haven or refuge⁷⁶ in the ports, harbours and internal waters of a nearby state in the interests of safe navigation and the need to protect endangered human life.

Although the fundamental humanitarian right to safety of the crew has not changed, the perceived threats posed to states that could potentially offer refuge are increasingly weighed against the right of the ship in distress to seek refuge in foreign ports or waters. Thus, while coastal states have traditionally respected the rights of ships in distress to seek such refuge in their coastal waters, more recently such states have also acquired a right to take exceptional measures against foreign ships in their maritime zones and on the high seas under the principle of protection in those situations where their coastal and maritime environmental security is threatened. The right of a coastal state to take action to protect its coastline from marine pollution is well established in international law.

As a result of a series of high-profile maritime incidents, in December 2003 the IMO Assembly finally adopted guidelines on places of refuge

(IMO Resolution A.949(23), 2003). The guidelines recognise that when a ship has suffered an incident, the best way of preventing damage or pollution from its progressive deterioration is to transfer its cargo and bunkers, and to repair the casualty. Such an operation is best carried out in a place of refuge. However, to bring such a ship into a place of refuge near a coast may endanger the coastal state, both economically and environmentally, and local authorities and populations may strongly object to the operation. The guidelines set out the criteria that should be taken into consideration when identifying appropriate sites.

There are certain aspects of any place that can enhance its attractiveness as a place of refuge, such as:

- a) the degree of shelter from prevailing weather;
- b) the absence of hazards to navigation;
- c) the presence of gently shelving, soft sand beaches;
- d) the availability of handling facilities such as wharves, jetties, tugs and repair services.

Similarly, there can be factors which militate against such use. A particular location may have a high sensitivity to pollution from certain combinations of ship and cargo. For instance in the case of crude oil pollution, greater damage will be sustained by a salt-water marsh than by rocks exposed to the scouring effects of the ocean.

In the event of a request for assistance, the coastal state is recommended to grant access to a place of refuge 'whenever reasonably possible' after weighing all the factors and risks involved in a balanced manner. If necessary, it can also adopt practical requirements, such as towing the ship out to sea. To ensure an objective and effective assessment of the situation, the guidelines contain a list of factors to be taken into account, including a comparative analysis of the risks of denying or granting access and the possible effects on

⁷⁶ While there is no uniform definition for a place of refuge, the term is generally understood to indicate a sufficiently sheltered area, not necessarily a port, where to safely conduct recovery operations with minimum risk to the ship, the environment and salvors.

neighbouring states. High priority is given to the environmental and social elements, whereas 'due regard' should be given to the commercial interests of the ship. The assessment, moreover, should be carried out by persons with expertise appropriate to the situation.

The UK Maritime and Coastguard Agency has identified two forms of assessment for places of refuge:

- a) Pre-event generic analysis of locations which could lend themselves to become a place of refuge for ships.⁷⁷
- b) Event-specific analysis of data relating to an incident as and when it occurs. Depending upon the nature of the incident this analysis may have to be made in a very short time indeed. In other cases time may permit longer and more detailed considerations to be made. In any case such considerations should be part of the incident's 'worst-case scenario' planning.

On the day, the event-specific information is 'plugged into' the generic analysis that has had careful review beforehand. The emphasis should be, as ever, on preparedness in the interests of minimizing adverse consequences.

It should also be recognised that identifying places of refuge may require cooperation between adjacent coastal states, where the proximity of state boundaries to the places of refuge may give rise to the potential for transboundary pollution.

6.3. Emergency towage vessels (ETVs)

ETVs are powerful, capable towing vessels carrying salvage equipment, such as pumps and fire-fighting gear, which are able to intervene positively in most marine emergencies to prevent a disabled ship drifting onto the rocks, thus protecting vulnerable coasts. Such vessels are typically paid for under contract to a coastal state as an emergency service, not unlike the fire brigade or ambulance service ashore.

ETVs were first used off the South African coast, where two of the world's most powerful salvage tugs were stationed following a number of serious accidents off this dangerous coast in the 1970s. Shortly afterwards, the French Government was persuaded by the *Amoco Cadiz* disaster on the coast of Brittany to commission two very powerful tugs, which have been on station ever since.

Over the years more coastal states have been encouraged to provide an emergency towing service as part of their contingency plans. The expense of such ships is justified by the huge savings from not having massive pollution, or the lives that may be saved when these powerful tugs are able to intervene. They stand by ships in trouble, and may not actually have to connect up the towline; just being in the vicinity gives valuable encouragement to the crew of a ship struggling to regain power after an engine breakdown. More coastal states are becoming convinced of their value. For the UK approach, for instance, see MCA (2008).

⁷⁷ Several states have undertaken such assessments as part of their oil spill preparedness and response planning, although in many cases the details are not publicly available.

7. References

Abdulla, A. and Linden, O. (eds) (In press).

Maritime traffic effects on biodiversity in the Mediterranean Sea: Review of impacts, priority areas and mitigation measures. Gland, Switzerland and Málaga, Spain: IUCN.

AMSA (Australian Maritime Safety Authority) (2005).

REEFVTS user manual. 2nd edition. Brisbane, Australia: Maritime Safety Queensland, and Canberra, Australia, AMSA. Available online at http://www.amsa.gov.au/Shipping_Safety/REEFVTS/User_Manual.pdf

AMSA (Australian Maritime Safety Authority) (2006).

AUSREP: Ship reporting instructions for the Australian area. March 2006 edition. Canberra, Australia: AMSA. Available online at <http://www.amsa.gov.au/Publications/AUSREP.pdf>

Boyle, A.E. (1985).

'Marine pollution under the Law of the Sea Convention'. *American Journal of International Law*, 79:347–372.

Churchill, R.R. and Lowe, A.V. (1999).

The Law of the Sea, 3rd edition. Manchester, UK: Manchester University Press.

Hakapaa, K. and Molenaar, E.J. (1999).

'Innocent passage—past and present'. *Marine Policy*, 23:131–145.

HMSO (1994).

Safer ships, cleaner seas. Report of Lord Donaldson's Inquiry into the prevention of pollution from merchant shipping. London, UK: HMSO.

Ilstra, T. (1989).

'Maritime safety issues under the Law of the Sea Convention and their implementation'. In: A.H Soons (ed.), *Proceedings of the 23rd Annual Conference of the Law of the Sea Institute*, pp.216-249. Honolulu, Hawaii: The Law of the Sea Institute.

IMO (International Maritime Organization) (2003).

Ships' Routeing, 7th Edition. Updated to include amendments adopted up to December 2003. London, UK: IMO.

ITOPF (International Tanker Operators Pollution Federation) (2005).

The ITOPF Handbook 2005/2006. London, UK: ITOPF.

Johnson, L.S. (2004).

Coastal state regulation of international shipping. Dobbs Ferry, New York: Oceana Publications.

MCA (UK Maritime and Coastguard Agency) (2008).

'Review of emergency towing vessel provision around the coast of the UK'. [Internet site] http://www.mcga.gov.uk/c4mca/mcga07-home/emergencyresponse/mcga-pollutionresponse/mcga-infrastructureandresources/mcga-dops_cp_review_of_etvp.htm, accessed 21 July 2008.

Molenaar, E.J. (1998).

Coastal state jurisdiction over vessel-source pollution. London, UK, The Hague, the Netherlands, and Boston, Massachusetts: Kluwer Law International.

Moller, T.H. (1997).

'The tanker owners' perspective on oil spill response'. Paper presented at ARPEL Seminar *Managerial Strategy for Oil Spills in Latin America*, 24–26 March 1997, Kingston, Jamaica. Available online at <http://www.itopf.com/information-services/publications/papers/owners.html>

NRC (US National Research Council) (2002).

Oil in the sea III: Inputs, fates and effects. Washington, DC: National Academy Press.

OECD (Organization for Economic Cooperation and Development) (2003).

Cost savings stemming from non-compliance with international environmental regulations in the maritime sector. Document DSTI/DOT/MTC(2002)8/FINAL Paris, France: OECD.

Plant, G. (1995).

'A European lawyer's view of the Government response to the Donaldson Report'. *Marine Policy*, 19:453–467.

Plant, G. (1997).

'The relationship between international navigation rights and environmental protection: A legal analysis of mandatory ship traffic systems'. In: H. Ringbom (ed.), *Competing norms in the law of marine environmental protection: Focus on ship safety and pollution prevention*, pp. 11–27. London, UK, The Hague, the Netherlands, and Boston, Massachusetts: Kluwer Law International.

Roberts, J. (2005).

'Protecting sensitive marine environments: the role and application of ships' routing measures'. *International Journal of Marine and Coastal Law*, 20:135–159.

Roberts, J. and Pullen, J.S.H. (In press).

'A review of global experience with particularly sensitive sea areas (PSSAs)'. In: N. Oral and F. Simard (eds), *Legal mechanisms to address maritime impacts on Mediterranean biodiversity*. Gland, Switzerland and Málaga, Spain: IUCN.

Roberts, J., Workman, T., Tsamenyi, M. and Johnson, L. (2005).

'The Western European PSSA: a "politically sensitive sea area"'. *Marine Policy*, 29:431–440.

Smith, B. (1982).

'Innocent passage as a rule of decision: Navigation versus environmental protection'. *Columbia Journal of Transnational Law*, 21:49–102.

US Coast Guard (2008).

'Vessel traffic services'. US Coast Guard Navigation Center [Internet site] http://www.navcen.uscg.gov/mwv/vts/vts_home.htm, accessed 21 July 2008.

Verlaan, P.A. (In press).

'Marine biodiversity, environmental conservation and maritime traffic: An overview of opportunities under the law of the sea to improve marine environmental conservation affected by maritime traffic'. In: N. Oral and F. Simard (eds), *Legal mechanisms to address maritime impacts on Mediterranean biodiversity*. Gland, Switzerland and Málaga, Spain: IUCN.

Warren, L.M. and Wallace, M.W. (1994).

'The Donaldson inquiry and its relevance to particularly sensitive sea areas'. *International Journal of Marine and Coastal Law*, 9(4):523–534.

Wonham, J. (1992).

'Special areas and particularly sensitive sea areas'. In: P. Fabbri (ed.), *Ocean Management in Global Change: Proceedings of the Conference on Ocean Management in Global Change*, pp. 361–381. Genoa, Italy: Routledge EF.

8. IMO documents

IMO Circular SN/Circ.227. *Guidelines for the installation of a Shipborne Automatic Identification System (AIS)*. 6 January 2003.

IMO Resolution A.857(20). *Guidelines for Vessel Traffic Services*. Adopted 27 November 1997.

IMO Resolution A.917(22). *Guidelines for the onboard operational use of shipborne automatic identification systems (AIS)*. Adopted 19 November 2001.

IMO Resolution A.927(22). *Guidelines for the designation of Special Areas under MARPOL 73/78 and guidelines for the identification and designation of particularly sensitive sea areas*. Adopted 29 November 2001. Annex I: 'Guidelines for the designation of Special Areas under MARPOL 73/78' (Special Area Guidelines).

IMO Resolution A.949(23). *Guidelines on place of refuge for ships in need of assistance*. Adopted 5 December 2003.

IMO Resolution MSC.43(64). *Guidelines and criteria for ship reporting systems*. Adopted 9 December 1994.

MEPC 46/6/2. *Designation of the marine area around the Florida Keys as a particularly sensitive sea area*. Submitted by the USA, 19 January 2001.

MEPC 53/20. *Amendments to Annex I of MARPOL 73/78 intended to prevent the risk of pollution during oil transfer operations between ships at sea*. Submitted by Spain and Mexico, 23 November 2004.

MSC 76/23. *Report of the Maritime Safety Committee on its seventy-sixth session*. 16 December 2002.

NAV 44/14. *Subcommittee on Safety of Navigation forty-fourth session: Report to the Maritime Safety Committee*. 4 September 1998.

NAV 46/3/2. *Proposed amendments to the General Provisions on Ships' Routeing to provide for a no anchoring area routeing measure*. Submitted by the USA, 5 April 2000, para. 2.

NAV 46/3/3. *No anchoring areas for Flower Garden Banks in the Northwestern Gulf of Mexico*. Submitted by the USA, 5 April 2000.

NAV 47/3/1. *No anchoring areas in the Tortugas Ecological Reserve and the Tortugas Bank in the Florida Keys*. Submitted by the USA, 15 February 2001.

NAV 48/3/5. *Amendment of the traffic separation scheme in the Bay of Fundy and approaches*. Submitted by Canada, 5 April 2002.

NAV 51/19. *Subcommittee on Safety of Navigation fifty-first session: Report to the Maritime Safety Committee*. 4 July 2005.

SOLAS/CONF.5/32. *Conference Resolution 1 and related amendments to the 1974 SOLAS Convention*. Adopted 12 December 2002.

SOLAS/CONF.5/34. *Conference Resolution 2 and related amendments to the 1974 SOLAS Convention and Conference Resolutions 3 to 11 (ISPS Code)*. Adopted 12 December 2002.

Chapter 4

Maritime traffic, marine biodiversity and the Green Paper on a future Maritime Policy for the EU

Stamatis Sivitos

1. Introduction

The marine environment is under ever-increasing pressure worldwide. Human activities and their plethora of effects have an increasing impact on the seas and oceans. The accelerated reduction of marine biodiversity, due notably to pollution, the impacts of climate change and overfishing among other factors, are warning signals that cannot be ignored. The Mediterranean region is a very rich area of biological and landscape biodiversity, creating a global hotspot for biodiversity worldwide. It is, however, a fragile and vulnerable environment, which has to be protected if it is to sustain these high levels of biodiversity.

Maritime traffic is a traditional sector of industry in the European Union (EU) that has been gaining importance over time. Since 90 percent of the EU's external and 40 percent of its internal trade is via shipping, 3.5 billion tonnes of cargo are transported per annum and 350 million passengers use maritime transport, the importance of maritime traffic to the EU is evident. Furthermore, specific sectors of the industry are growing rapidly. The cruise industry, for instance, has achieved 10 percent annual growth in the last few years, whereas the construction of recreational boating has been steadily rising and is forecasted to grow by 5–6 percent annually (European Commission, 2006b). These activities, however, come at an associated environmental cost which cannot be overlooked and is becoming increasingly significant.

This chapter addresses the issues, challenges and opportunities in the Green Paper for a Future Maritime Policy of the European Union that are related to the effects of maritime traffic on biodiversity, taking a Mediterranean perspective

wherever possible. A brief description of the state of play of the future Maritime Policy for the EU as well as other relevant policies concerning the impact of maritime traffic on marine biodiversity is given, followed by an analysis of the associated issues in the Green Paper. Finally the opportunities and shortcomings regarding this issue are identified and some possible future actions are suggested.

1.1. Development of biodiversity policies in the European Union

The development of policies related to biodiversity in the EU has been undertaken in a sectoral manner, at both international as well as European levels. The EU is a party to the Convention on Biological Diversity (CBD), the Cartagena Protocol on Biosafety, as well as international conventions and organizations such as the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention), Baltic Marine Environment Protection Commission (HELCOM), International Council for the Exploration of the Sea (ICES), World Summit on Sustainable Development (WSSD), Barcelona Convention, International Maritime Organization (IMO), Mediterranean Pollution Monitoring Programme (MEDPOL) and others. The European Commission (EC) published the 'European Community Biodiversity Strategy' in 1998, followed by sectoral plans on economic and development cooperation, fisheries, agriculture and conservation of natural resources. Furthermore, the Birds and Habitats Directives, the Water Framework Directive (WFD) and Common Fisheries Policy (CFP) partly relate to the marine environment but do not address the issue of marine protection in an holistic way (Borja, 2006).

2. Maritime traffic, marine biodiversity and the EU

2.1. Green Paper on a future Maritime Policy—background rationale

The European Commission in its Strategic Objectives for 2005–2009 noted ‘the particular need for an all-embracing maritime policy aimed at developing a thriving maritime economy and the full potential of sea-based activity in an environmentally sustainable manner’ (European Commission, 2007a).

In June 2006, the EC launched the Green Paper (GP) to begin the period of consultation on the future Maritime Policy. The rationale behind the GP was to bring the various sectors related to the marine environment under one umbrella and to change the design and implementation of policies at EU, national and local levels. At the time of writing (May 2007), the follow-up to the GP was to be a Communication pointing to future actions; these would be published in an Action Plan in October 2007.⁷⁸

The GP highlights the importance of the marine environment and biodiversity: ‘A healthy marine environment is a *sine qua non* to realising the full potential of the oceans. For this reason, preservation of this resource base is the key to improving the EU’s competitiveness, long-term growth and employment.’ It further points out the relationship between a healthy marine environment and its impact on human health. Striking the balance between the different sectors (including maritime traffic) is therefore required to achieve this ‘common vision’.

Apart from the future Maritime Policy for the EU, other legislation has been produced by the European Commission that is directly related to the protection of marine biodiversity, as discussed below.

2.2. Marine Thematic Strategy

The ‘Thematic Strategy on the Protection and Conservation of the Marine Environment’, launched in October 2005, ‘aims to achieve good environmental status (GES) of the EU’s marine waters by 2021 and to protect the resource base upon which marine-related economic and social activities depend’ (European Commission, 2007b). It is the driver for the protection of the EU marine environment and is termed the environmental component of the future Maritime Policy. A proposed Marine Strategy Directive (European Commission, 2005b) within this context has been tabled and at the time of writing was at the phase of second reading in the European Parliament.

The Marine Strategy encourages the use of a spatial planning system as a tool for the achievement of its aim. The system will be controlled by Member States for maritime-related activities that would license, promote or alternatively place restrictions on maritime activities to be implemented. This system should be based on an ecosystem approach. It intends also to provide the appropriate governance framework—i.e. management units (Marine Regions) and further tools (regional Marine Strategies)—for the effective protection of the EU marine environment.

The Marine Strategy, which is objective driven, will establish clear environmental targets and monitoring programmes, define good environmental status at regional level and contain a detailed assessment of the state of the marine environment.

2.3. Horizon 2020

In its Communication to the Council and the European Parliament *Establishing an*

⁷⁸ The Action Plan and the accompanying vision document on an Integrated Maritime Policy for the European Union (the ‘Blue Book’) are now available online at http://ec.europa.eu/maritimeaffairs/dev_imp_en.html [Editor’s note].

environment strategy for the Mediterranean (European Commission, 2006d) in September 2006, the European Commission pointed out that the EU 'must play its role in protecting this common heritage' as a major regional player. It outlines the 'Horizon 2020' initiative which aims to tackle the most significant sources of pollution in the Mediterranean by the year 2020. For this purpose, a coalition of partners

to implement this is being established by the European Commission. Among the activities planned, research will be undertaken to analyse the environmental issues relevant to the Mediterranean and to develop appropriate indicators, pollution reduction projects will be set up, capacity building will be promoted, and a monitoring and review committee will be established at Council level.

3. Green Paper on a future Maritime Policy for the EU

3.1 The Green Paper

3.1.1. Aim

The Green Paper (European Commission, 2006b) aims to launch a debate about the future Maritime Policy for the EU that treats the oceans and seas in an holistic way. The various policies that have been developed in the past on maritime transport, industry, coastal regions, offshore energy, fisheries, the marine environment and other relevant areas have been produced separately. It is vital that all these elements are brought together, and the creation of a policy that is ‘integrated, intersectoral and multidisciplinary, and not a mere collection of vertical sectoral policies’, is stressed in the Green Paper. It further strives to open the dialogue between all the relevant stakeholders, ranging from the shipping community to anglers and environmental NGOs and to governments.

3.1.2. Maritime traffic and its impact on marine biodiversity

The Green Paper raises various questions that relate to maritime traffic and its impact on biodiversity. A list of the relevant questions—some of these touch more on the area than others, but all are related to maritime traffic—is given below.

- a) How can maritime policy contribute to maintaining our ocean *resources and environment*?
- b) How can a maritime policy further the aims of the *Marine Thematic Strategy*?
- c) What further steps should the EU take to mitigate and adapt to *climate change* in the marine environment?
- d) What specific measures promoting the *sustainable tourism* development of coastal regions and islands should be taken at EU level?

- e) How can *energy efficiency* improvements and fuel diversification in shipping be achieved?
- f) What are the principles and mechanisms that should underpin *maritime spatial planning* systems?
- g) Should a comprehensive network of existing and future *vessel tracking systems* be developed for the coastal waters of the EU? What data sources should it use, how would these be integrated, and to whom would it deliver services?
- h) How could the *regulatory framework* for the maritime economy be improved to avoid unintended and contradictory impacts on maritime goals?
- i) To what extent can economic *incentives, self regulation and corporate social responsibility* complement government regulation?
- j) How can the EU best ensure the continued sustainable development of *ports*?
- k) What role can be played by *regional centres* of maritime excellence?

3.2. Analysis

Based on the questions listed above, the impacts of maritime traffic on marine biodiversity that are raised in the Green Paper are identified below and the various policy options are further explored.

3.2.1. Maritime traffic

3.2.1.1. Ship movements and groundings

The Green Paper states clearly that ship movements within the EU are projected to increase. That includes the transportation of cargo as well as that of passengers. The following

points raised in the Green Paper will add to this increase:

- Modal shift from land-based goods transportation to the sea, due to lower energy consumption per tonne at sea;
- Retention of the EU's global leadership in shipping, which could potentially increase maritime traffic in EU waters even further.

The Green Paper raises an opportunity for the installation of environmentally friendlier technologies on ships, improving the overall environmental performance of the sector and making it more sustainable than at present. However, these improvements may not necessarily reduce the overall effects of maritime traffic on the marine environment, since these would be offset by the sheer rise in maritime traffic volume within EU waters and its associated impact. This has previously been the case with the increase in road traffic volume, for example, offsetting the technological advances in motor vehicles.

Moreover, the importance of ports in the context of international trade is recognised in the Green Paper, suggesting the potential for growth, which would put further pressure on the already burdened marine environment. This issue will be explored later in this chapter.

3.2.1.2. Oil spills, ship accidents and sewage discharges

Questions (a) and (b) deal with the contribution of the future Maritime Policy to maintaining ocean resources and the marine environment as well as furthering the aims of the Marine Thematic Strategy. Within this context, the issue of dividing the EU marine area into smaller subregions has been raised by the shipping industry (ECSA, 2007). This could give rise to a plethora of rules for ships crossing from the Mediterranean to the Black Sea and vice versa, potentially raising even further the already significant number of high-profile incidents and disasters that have occurred in recent years. The Bremen Declaration on the Future Maritime Policy of the EU 'considered it absolutely essential that there be internationally binding rules governing environmental and safety provisions that are addressed to ships and their

crews' (Bremen Declaration, 2007). This would create uniform regulation and potentially minimize such risks.

Question (g) tackles the further development and integration of existing vessel tracking systems in the coastal waters of the EU. The system already developed by the European Commission and operated by the European Maritime Safety Agency (EMSA), the so-called 'SafeSeaNet', assists in the exchange of safety and security information between the various competent authorities. The improvement of this real time information trafficking system which the GP calls for, if expanded to tracking discharges and oil spills from ships at sea, would increase the level of preparedness and response at EU level. Such deliberate discharges would be identified and responded to—through appropriate mechanisms such as the coastguard at Member State level—much faster than at present, and would further increase the environmental liability of shipowners and operators. In the case of oil spills, this would result in containing the pollution and minimizing the potential environmental impact on marine biodiversity.

Maritime safety and environmental protection has been the subject of considerable maritime research effort over the last three European Research Programmes. Results from these research projects have improved our understanding of the cause of accidents, put in place guidelines for emergency response, pollution prevention and control, and provided technical solutions for more advanced and safer vessels. Details of the current research programmes at European Community level are given in section 3.3.

3.2.1.3. Engine emissions from recreational and commercial vessels

Emissions from shipping (particularly CO₂, NO_x and SO_x) are on the rise. Addressing question (c), on mitigation and adaptation to climate change in the marine environment, will require energy efficiency improvements and fuel diversification in shipping. These two topics are gaining higher priority on the EU agenda and therefore the introduction of legislation could be much swifter for them than for other impacts of maritime traffic on the marine environment.

The Green Paper urges that shipping emissions be kept within the limits proposed by the EC Air Thematic Strategy (European Commission, 2005a). It is important first, though, to implement existing legislation and assess its effectiveness before introducing new measures. In the long term, the environmental legislation of the European Community should reflect international regulations wherever possible, which is not always the case. For example, elements of the EU's Sulphur Directive (European Union, 2005), concerning passenger ships and fuels used in ports, do not conform to international rules. Research initiatives and actions have already been taken up for these sources of pollution by the European Commission, details of which are given later in this chapter.

3.2.1.4. Species introductions and TBTs

The problems of species introductions in ships' ballast water and the use of tributyltins (TBTs) to prevent the growth of organisms on hulls, thereby increasing speed and lowering fuel consumption, are recognised in the Green Paper and furthermore the ratification of international conventions is supported. The Green Paper encourages the introduction and use of ballast water treatment technologies in the EU Member States, in line with international efforts to combat this issue in developing countries particularly through the International Convention on the Control of Harmful Anti-Fouling Systems (AFS) on Ships and the International Convention for Control and Management of Ship's Ballast Water and Sediments (BWM). The EC further contributes to the efforts of the International Maritime Organization (IMO) in implementing the Global Environmental Fund and United Nations Development Programme (UNDP), towards helping developing countries understand the problem, monitor the situation and prepare for these Conventions. Examples of the EC contribution to the Global Ballast Water Management Programme are research framework programme 5 (FP5) research projects TREBAWA and MARTOB. These address the issue of ballast water treatment by focusing on the development of a new economically and technically competitive system to be employed on board.

3.2.2. Ports

Ports, which play a significant role in the freight logistics network, are a hotspot of maritime activity and disturbance to marine biodiversity. The Green Paper points out that further development of ports within the initiatives termed 'Motorways of the Seas' and 'Short Sea Shipping'—which is 'a logistics concept [that means] performing the sea leg of door-to-door freight transport of containers, trailers, general cargo and bulk ...' (EU Press Office, 2006)—will have to be in accordance with the EC Birds and Habitats Directives and the Natura network.

Due to the anticipated growth in the shipping and port sector, increased efficiency is required, an issue raised in question (j) on the sustainable development of ports. A marine spatial planning system encompassing the coastal zone, as suggested in the Marine Thematic Strategy, will prevent conflict between the pressure for development and environmental protection. This system will strategically identify areas of utmost priority for protection, help to meet nature conservation commitments and mark out 'preferred development zones' for future growth and expansion of port and hinterland infrastructure. The need to eliminate fragmentation through a clear and consistent framework is underlined in the Green Paper. The question that is raised here is whether fewer, more concentrated but busier ports would be environmentally friendlier than a greater number of dispersed but smaller ports.

Furthermore, the issue of port state control is raised in the annexes to the Green Paper (European Commission, 2006c). As pointed out, port state control is the main mechanism for ensuring the implementation of safety rules for ships from various flag states which do not always conform to strict safety standards. The need for the implementation of IMO rules at European level is highlighted once more because of the varying quality standards among ships, which can potentially lead to accidents such as those experienced in the past. The difficulties of port relocation and movement are also underlined. The creation of regional clusters could be a solution to such an issue (Question (k)). These clusters—also known in France as 'regional

poles of competitiveness’—promote the best practices identified within them and give rise to the exchange of environmental best practice in the shipbuilding industry.

3.2.3. Mediterranean issues

The Green Paper highlights that Member States should use the United Nations Environment Programme Mediterranean Action Plan (UNEP-MAP) and the Euro-Mediterranean Partnership (the ‘Barcelona Process’) specifically for carrying out marine spatial planning in the Mediterranean. This should build upon the Marine Thematic Strategy, which proposes that ecosystem-based management should include regional planning.

The Mediterranean, which is part of the sea route between Asia and Europe via the Suez Canal, could benefit from this. Areas of the Mediterranean should be identified and designated as marine protected areas (MPAs) and particularly sensitive sea areas (PSSAs) in order to protect them from busy shipping routes. The issue of PSSAs needs to be reviewed and legislation strengthened (see the detailed discussion by Roberts & Pullen in chapter 2 in this volume). The suggested improvement of the protective measures for existing PSSAs in the Baltic Sea, such as the introduction of a joint Vessel Traffic Monitoring and Information System (VTMIS) for the main shipping lanes, could be applied to the Mediterranean region. Such a system would increase marine protection, while at the same time it would assist in situations involving vessels in distress and provide prompt response.

3.3. Emerging solutions

3.3.1. Legislation

The reinforcement of EU maritime safety policy, which has been gaining increased attention following high-profile tanker disasters (such as the *Erika* and the *Prestige*), will further minimize the risk of accidents and thus enhance the protection of marine biodiversity. The Green Paper specifically raises the need for the gradual withdrawal of single-hull oil tankers, the strengthening of port inspections and control of ships flying an EU flag, closer monitoring and implementation of existing legislation, and examination of the liability issue for environmental damage. Specifically, the

designation of ‘places of refuge’—safe locations where ships can shelter from bad weather to protect their structures and cargoes and where assistance can be provided to ships in distress much more easily than in the open sea—is an example of legislation proposed by the EC under the Third Maritime Safety Package (3rd MSP), showing how maritime safety measures can indirectly aid the protection of the marine environment. Contingency planning for shipping could be strengthened further with models such as the UK’s ‘SOSREP’, whereby the Secretary of State’s Representative for Maritime Salvage and Intervention has overall charge in the decision-making process during an emergency, without any external political influences. Such examples and practices should be taken up by other Member States. Furthermore, national coastguard systems should be further integrated within the role of EMSA for this purpose. Reinforcing the Community Civil Protection Mechanism, which is the operational instrument aimed at mobilizing assistance from the Member States and partner countries in response to disasters, including those at sea, would increase preparedness and mobility in case of accidents and reduce the associated risk for the marine environment.

A multilateral agreement protecting marine biodiversity under the United Nations Convention on the Law of the Sea (UNCLOS) needs to be reached. Although UNCLOS is the overarching legislative framework governing the marine environment, the link to the Convention on Biological Diversity should be clarified concerning the protection of marine biodiversity in waters outside national jurisdiction.

The protection of the marine environment has been gaining increased attention, and the European Commission and Member States have to work together for the development of the UN global marine assessment programme. This would further raise the status of biodiversity in a global context, which would also be in line with the EU’s Gothenburg target of halting the loss of biodiversity by 2010 (European Commission, 2006a).

Specific tools, such as the Marine Protected Areas model, are a possible means for addressing specific issues, such as the control of noise from maritime traffic. The example of Marine

Environmental High Risk Areas (MEHRAs), already introduced in the UK, could be used within the framework of the marine spatial planning system. This tool, which is based on risk analysis, could be used to identify traffic separation schemes, deepwater routes and compulsory pilotage for adoption through appropriate processes and thus address localized risks from maritime traffic.

Farmer *et al.* (2007) suggest that the Green Paper could be a means of promoting the Marine Thematic Strategy and its related Directive, making sure that the latter is adopted and developing future instruments that would further support this. Furthermore, international policy commitments are underlined and the coherence of the Maritime Policy with other policies is further stressed. The European Commission intends to review existing legislation and recognise potential synergies or contradictions between the various policies with the help of stakeholders.

Dealing with the issue of shipping routes would require the interlinkage of regional and local systems. To set up spatial planning in regional ecosystems, Member States should use 'regional organisations whose activities impact on maritime activities, such as HELCOM for the Baltic, OSPAR for the North East Atlantic, the UN-MAP and the Barcelona Process for the Mediterranean, as well as regional and international fisheries organisations'. The 'Common EU maritime space' could further support effective environmental protection of the marine environment by providing a harmonized framework for maritime traffic within EU waters (European Commission, 2006b).

Additionally, self-regulation and corporate social responsibility (CSR) initiatives could be means for the various players involved in shipping to encourage sustainability within the sector, promoting a positive environmental image for the companies while at same time ensuring environmental protection.

3.3.2. Technology and innovation

Progress has been made in reforming shipping regulations in recent years and promoting 'quality shipping'. An example of such efforts is the WATERBORNE initiative. This initiative—within the framework of LeaderSHIP 2015 (European Commission, 2003)—is a technology platform

bringing together stakeholders from the maritime and inland sectors. One of its aims is to produce a ship with drastically reduced emissions to air and sea that will specifically tackle the following areas:

- a) environmentally friendly materials—improvements with respect to the TBT content of ship paints;
- b) lower sulphur, nitrogen oxide (NO_x) and particulate matter (PM) emissions;
- c) double-hull design;
- d) appropriate disposal of ballast water as well as the treatment of engine oil and other waste.

Further to this, ports with environmentally friendly facilities will further reduce the pressures on the marine environment. Such facilities include, among others:

- a) energy supply for ships at ports, thus minimizing the use of engines and related air emissions;
- b) waste facilities for the disposal of ship waste.

The initiative is supported by the European Commission and will be strengthened in the European Union's seventh research framework programme (FP7), covering the period 2007–2013. As mentioned above, significant research efforts have been made at EU level, but more are needed to assess which ports, vessels and maritime routes are currently most vulnerable, whether these risks are increasing, what the potential damage from different traffic patterns would be and how well ship-owners and ports are complying with safety and security legislation.

3.3.3. Research

The EU sixth framework programme (FP6) Integrated Project HERCULES tackles gaseous and particulate emissions from marine engines. It aims to develop new technologies to drastically reduce these while increasing engine efficiency and reliability, hence reducing specific fuel consumption, CO₂ emissions and engine life

cycle costs (HERCULES, 2004). Furthermore, the FP6 Integrated Projects FELICITAS and MC-WAP contribute to reducing air-pollution especially close to densely populated sea corridors by aiming to accelerate the development and deployment of cost-competitive, European fuel cell-based energy systems and component technologies for maritime transport (FELICITAS, 2005; MC-WAP, 2005).

The FP6 research project POP&C (Pollution prevention and control—safe transportation of hazardous goods by tankers) is focused on prevention and mitigation in ship design and operation for existing and new vessels. Specific objectives include the development of risk-based methodologies for measuring the oil spill potential of tankers, for passive pollution prevention (design and operational lines of defence), as well as for active post-accident pollution mitigation and control (POP&C, 2004).

3.3.4. Financial instruments

Baltic Master, an Interreg project partly funded by the European Union to enable Europe's regions to work together, deals with the management of maritime safety and accidents in the Baltic Sea (Baltic Master, 2005). Similar initiatives, in which Community funds are used to support the implementation of policy measures, should be set up for the Mediterranean, which is an area of grave importance for maritime safety and management of the associated risk.

Funding for training programmes would increase the environmental awareness of stakeholders dealing with the marine environment on a daily basis. Opportunities are needed for the training and capacity building of ships' crews, port handlers and all other personnel directly involved in the maritime traffic issues that have a negative impact on the marine environment, in order to promote sustainability and environmental protection.

3.3.5. The Mediterranean region

Baltic Sea countries cooperate multilaterally within the framework of the Baltic Sea Region Border Control Co-operation. Following the model in the Baltic Sea region, the creation of a cross-sectoral Mediterranean Sea Conference could be

considered within the Barcelona process and the EU's Neighbourhood Policy for Mediterranean countries. Moreover, the EU could lead diplomatic efforts to promote such a coordinated approach towards the marine environment in the Mediterranean.

The environmental quality of the marine environment in the vicinity of tourist destinations can significantly influence their popularity. To ensure sustainable development of tourism and the development of ecotourism, the protection of the sea is mandatory. The diversification of maritime traffic activities aimed at tourists (including leisure cruises and transport as well as recreational activities) will extend the season, thus reducing the occurrence of acute environmental impacts. The development of educational programmes designed specifically for tourists and personnel interacting with maritime traffic activities in popular tourist destinations will further support such efforts.

Funding should be made available from the European Commission to further the knowledge and understanding of the impacts of maritime traffic on biodiversity in the Mediterranean, in view of the increasing environmental pressures in this area.

3.4. Weaknesses of the Green Paper

The proposed legal framework behind the Green Paper is weak with respect to environmental protection. The Green Paper relies solely on the Marine Thematic Strategy for the implementation of the environmental component of the future Maritime Policy. If the Marine Strategy Directive fails to deliver its environmental objectives, the future Maritime Policy will be significantly lacking in this area (Farmer *et al.*, 2007). Furthermore, according to the same source, the general support for economic development of the maritime sector could result in greater natural resource use.

There is also a lack of coherence within the Green Paper regarding the integration of environmental concerns within the future Maritime Policy for the EU. The Maritime Policy, which relies solely on the Marine Strategy as mentioned above, has a number of gaps and open questions related to environmental protection in the marine environment, rather than having a horizontal,

cross-cutting environmental component. Other relevant European Community legislation should be brought into it, specifically all the obligations the EC has in relation to shipping, such as the Double-Hull Regulation (European Union, 2002), which sets out a timetable for phasing out single-hull oil tankers worldwide.

The Green Paper has been criticised for having a primarily economic focus (Farmer *et al.*, 2007), despite the fact that the ecosystem approach is frequently mentioned. Aspects such as the importance of maritime traffic in world trade, its importance to cargo transportation, Europe's competitiveness in shipbuilding innovation and the industry's employment potential are highlighted significantly more times than its impact on biodiversity. This, combined with the fact that the Green Paper fails to specify how the protection of biodiversity will be incorporated into policies on maritime traffic and its environmental impact, shifts the focus even further away from the conservation of marine biodiversity.

3.5. Future steps and recommendations for the Mediterranean

The Green Paper was written with the whole of the EU marine environment in mind. However, opportunities arise for the Mediterranean with respect to the impact of maritime traffic on marine biodiversity, which include:

- a) The application of international rules for the harmonization of the regulatory framework, which should be promoted by the European Commission. This will prevent regional disparities in legislation involving maritime traffic.
- b) Improvement of the real-time traffic information and surveillance system

'SafeSeaNet' for the prevention of and more effective response to accidents and environmental offences. This could be supported at EU level as well as by countries bordering the Mediterranean.

- c) Application of the marine spatial planning system under the Marine Strategy Directive, with the use of tools such as Marine Protected Areas (MPAs), Particularly Sensitive Sea Areas (PSSAs) and Marine Environmental High Risk Areas (MEHRAs), in order to minimize environmental pressures in them.
- d) Exchange of environmental best-practice examples from regional seas such as the Baltic region. The regional and local systems within the Mediterranean should be interlinked.
- e) Establishment of a Mediterranean Sea Conference, adopting concrete proposals for the protection of the marine environment.
- f) Improvement of port facilities and strategic environmental impact assessments (SEA) for their future expansion and redevelopment.
- g) Diversification and dispersion of tourism activities throughout the year, thus minimizing the concentration of the impacts during a few months (usually summer).
- h) Education and awareness-raising measures aimed at tourists regarding the environmental pressures on the local environment; training schemes for local personnel and capacity building.

4. Conclusions

The Green Paper on the future Maritime Policy for the EU has attempted to place all the disciplines and activities relating to the sea in the European Union under one roof. By definition, this task has been complex due to the great variety of actors and issues interrelated with the marine environment. This chapter has addressed the opportunities, challenges and weaknesses arising within the Green Paper concerning the impact of maritime traffic on marine biodiversity in the Mediterranean. The following recommendations can be made:

- a) The future Maritime Policy for the EU should not only rely on the Marine Strategy Directive, but have environmental considerations as a horizontal, cross-cutting component.
- b) Regional conventions such as the Barcelona Convention should be taken further into consideration and explicit reference should be made to the commitments under these.
- c) The implementation of Natura 2000 needs to be expanded into marine areas, without having to introduce new legislation.
- d) Marine biodiversity has to be linked further to economic considerations, thus raising the economic value of Mediterranean ecosystem services and obliging the actors involved to further conserve it.
- e) Environmental best practice examples must be exchanged and a Mediterranean Sea Conference established.
- f) Tourism activities should be diversified and distributed more evenly throughout the year in the Mediterranean.
- g) The future Maritime Policy should provide detailed mechanisms to improve the integration of environmental protection into the shipping sector.
- h) All relevant EU environmental legislation should be invoked to underpin the Maritime Policy across all sectors, and not just the Marine Strategy Directive. Specifically the Water Framework Directive, the Birds and Habitats Directives, and the Air Quality Framework Directive and its daughter directives should be incorporated, where these apply.
- i) The precautionary principle, best available techniques, best environmental practice, as well as the polluter-pays principle should be firmly integrated in the Maritime Policy to address and prevent the environmental impacts of maritime traffic.
- j) The Maritime Policy should tackle marine and coastal spatial planning through an ecosystem-based approach, and provide the framework for all marine activities, including maritime traffic.
- k) Opportunities for capacity building and the training of resort staff and holidaymakers regarding sustainable use and environmental protection should be emphasised.
- l) Funding for environmental research aimed at facilitating and furthering the aims of the Maritime Policy should be provided at EU level.

5. References

Baltic Master (2005).

Baltic Master: maritime safety across borders. [Website] <http://www.balticmaster.org/>, accessed on 01/05/2007.

Borja, Á. (2006).

'The new European Marine Strategy Directive: Difficulties, opportunities, and challenges', *Marine Pollution Bulletin*, 52:239–242.

Bremen Declaration (2007).

Bremen Declaration on The Future Maritime Policy of the EU. Conclusions of the European Conference on 'The Future Maritime Policy of the EU: A European Vision for Oceans and Seas' in Bremen from 2 to 4 May 2007. Bonn, Germany: Federal Ministry of Transport, Building and Urban Affairs (BMVBS). Available online at http://www.bmvbs.de/Anlage/original_994929/Bremen-Declaration-on-The-Future-Maritime-Policy-of-the-EU.pdf

ECSA (European Community Shipowners' Associations) (2007).

Green Paper towards a future Maritime Policy for the Union: A submission by the European Community Shipowners' Associations (ECSA). Brussels, Belgium: ECSA. Available online at <http://www.ecsa.be/publications/072.pdf>

European Commission (2003).

LeaderSHIP 2015: Defining the future of the European shipbuilding and repair industry—competitiveness through excellence. Commission Communication COM(2003) 717. Available online at http://ec.europa.eu/enterprise/maritime/maritime_industrial/leadership_2015.htm

European Commission (2005a).

Thematic Strategy on Air Pollution. Commission Communication COM(2005) 446, {SEC(2005) 1132} {SEC(2005) 1133}. Available online at http://eur-lex.europa.eu/smartapi/cgi/sga_doc?smartapi!celexplus!prod!DocNumber&lg=en&type doc=COMfinal&an doc=2005&nu doc=446

European Commission (2005b).

Proposal for a directive of the European Parliament and of the Council establishing a framework for Community action in the field of marine environmental policy (Marine Strategy Directive). Commission proposal COM(2005) 505 final, {SEC(2005) 1290}. Available online at http://eur-lex.europa.eu/LexUriServ/site/en/com/2005/com2005_0505en01.pdf

European Commission (2006a).

Halting the loss of biodiversity by 2010—and beyond: Sustaining ecosystem services for human well-being. Commission Communication COM/2006/0216 final, {SEC(2006) 607} {SEC(2006) 621}. Available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52006DC0216:EN:NOT>

European Commission (2006b).

Green Paper: Towards a future Maritime Policy for the Union: A European vision for the oceans and seas. COM(2006) 275 final, {SEC(2006) 689}. Available online at http://ec.europa.eu/maritimeaffairs/policy_en.html#com and at [http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52006DC0275\(02\):EN:NOT](http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52006DC0275(02):EN:NOT)

European Commission (2006c).

‘Background paper no. 6 on maritime safety and security’. Annex to: *Green Paper: Towards a future Maritime Policy for the Union: A European vision for the oceans and seas.* COM(2006) 275 final, {SEC(2006) 689}. Available online at http://ec.europa.eu/maritimeaffairs/suppdoc_en.html

European Commission (2006d).

Establishing an environment strategy for the Mediterranean. Commission Communication COM/2006/0475 final, {SEC(2006) 1082}. Available online at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52006DC0475:EN:NOT>

European Commission (2007a).

‘FAQs: Questions and answers on a future Maritime Policy for the Union’. *Maritime Affairs* [website], http://ec.europa.eu/maritimeaffairs/faq_en.html

European Commission (2007b).

‘A Marine Strategy to save Europe’s seas and oceans’. *WISE: Water Information System for Europe* [website], http://ec.europa.eu/environment/water/marine/index_en.htm

European Union (2002).

‘Regulation (EC) No 417/2002 of the European Parliament and of the Council of 18 February 2002 on the accelerated phasing-in of double hull or equivalent design requirements for single hull oil tankers and repealing Council Regulation (EC) No 2978/94’. *Official Journal*, L 64, 7.3.2002, pp.1–5. Available online at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32002R0417:EN:NOT>

European Union (2005).

‘Directive 2005/33/EC of the European Parliament and of the Council of 6 July 2005 amending Directive 1999/32/EC’ (‘Sulphur Directive’). *Official Journal*, L 191, 22/07/2005, pp.59–69. Available online at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32005L0033:EN:NOT>

EU Press Office (2006).

‘Boosting Short Sea Shipping and Motorways of the Sea’. Europa Press Release IP/06/987 of 13/07/2006. Online at <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/06/987>. Accessed on 05/05/2007.

Farmer, A., Herodes, M. and Lutchman, I. (2007).

‘EU Marine Policies—The Maritime Policy Green Paper and EU Marine Strategy Directive’. In: H. von Nordheim and C.G. Lundin (eds), *Countdown 2010 for marine ecosystems*, pp.87–96. Bonn, Germany: Bundesamt für Naturschutz (BfN—Federal Agency for Nature Conservation). Available online at <http://www.bfn.de/fileadmin/MDB/documents/service/skript218.pdf>

FELICITAS (2005).

Felicitas [website], <http://www.felicitas-fuel-cells.info/index.php>, accessed on 01/05/2007.

HERCULES (2004).

IP-HERCULES: High Efficiency R&D on Combustion with Ultra Low Emissions for Ships [website], <http://www.ip-hercules.com/article/english/2/index.htm>, accessed on 01/05/2007.

MC-WAP (2005).

MC-WAP [website], <http://www.mc-wap.cetena.it/>, accessed on 01/05/2007.

POP&C (2004).

'POP&C Project'. *Pollution prevention and control (POP&C): Safe transportation of hazardous goods by tankers* [website], <http://www.pop-c.org/>, accessed on 01/05/2007.

Roberts, J. and Pullen, J.S.H. (In press).

'A review of global experience with particularly sensitive sea areas (PSSAs)'. In: N. Oral and F. Simard (eds), *Legal mechanisms to address maritime impacts on Mediterranean biodiversity*. Gland, Switzerland and Málaga, Spain: IUCN.



**INTERNATIONAL UNION
FOR CONSERVATION OF NATURE**

IUCN CENTRE FOR MEDITERRANEAN COOPERATION

Parque Tecnológico de Andalucía
C. / Marie Curie, 35 (Sede Social)
29590 - Málaga (Spain)
Tel 34 - 952 02 84 30
Fax 34 - 952 02 81 45
uicnmed@iucn.org
www.uicnmed.org
www.iucn.org/mediterranean

Core support to the IUCN Centre for
Mediterranean Cooperation is provided by:

