

Marine species beyond borders: a case study of regional and interconnected species and habitat protection and understanding a migratory range approach

Migratory Species: A Passport to 2010
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Cetaceans (whales, dolphins and porpoises) and marine turtles across the world's oceans are experiencing multiple, cumulative and synergistic threats that are both increasing and affecting the survival probability of many species and populations.¹ These threats are widespread, but the combination and intensity differ from region to region and species to species.

The cumulative nature of the threats means that single issue specific management is no longer appropriate. By protecting the critical habitats of migratory species across their migratory range, and by underpinning this protection with conservation mechanisms that consider and address the multiple, cumulative and synergistic threats to the species themselves and the ecosystems on which they depend, a migratory range approach emerges that offers great potential for species and environment conservation.² This approach both facilitates greater cooperation between States, but also assists in the delivery of biodiversity conservation obligations.

Two regional instruments under the Convention for the Conservation of Migratory Species of Wild Animals (also known as CMS or the Bonn Convention) - the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS) and the Memorandum of Understanding on the Conservation and Management of Marine Turtles and their Habitats of the Indian Oceans and South-East Asia (IOSEA Marine Turtle MoU) - offer potential models to consider in developing a migratory range approach to species conservation.

The CMS is a global intergovernmental treaty concerned exclusively with the conservation of avian, marine and terrestrial migratory species as well as the habitats on which they depend. The Convention organises transboundary cooperation for species migrating across or outside national boundaries, such as cetaceans and marine turtles, and develops the legal framework for conservation measures throughout their migratory range.

One of the half-dozen global conventions concerned with the conservation and management of global biodiversity CMS is the only global biodiversity-related treaty that addresses comprehensively migratory species. It provides an important platform to develop and tailor regional and species specific measures according to particular conservation needs. The migratory range approach that is possible under CMS can provide a passport to achieving the 2010 biodiversity targets.³

1. The value of migratory marine species

Migratory marine species live within an vast aquatic environment that covers over 70% of the Earth's surface. Their habitats are foreign to humans, comprising epic landscapes of mountain ranges, plains, volcanoes, deep trenches; often eclipsing the size or majesty of many terrestrial counterparts. Driven by massive and layered currents and counter-currents, channels and columns of water, the ocean mass is stratified by temperature and salinity creating a three dimensional environment. Some dimensions remains isolated for ten of thousands of years.⁴ Within this complex system are the migratory pathways of many marine species.

¹ Reeves R, Smith B, Crespo EA, Notarbartolo di Scaia G, DOLPHINS, WHALES AND PORPOISES 2002-2010 CONSERVATION ACTION PLAN FOR THE WORLD'S CETACEANS (IUCN/SCC Cetacean Specialist Group, IUCN, Gland, Switzerland and Cambridge, 2003); IUCN/SSC Marine Turtle Specialist Group, A GLOBAL STRATEGY FOR THE CONSERVATION OF MARINE TURTLES (IUCN/SSC Marine Turtle Specialist Group, IUCN, Gland, Switzerland and Cambridge 1995)

² Glowka L, A Guide to the Complementarities Between the Convention on Migratory Species and the Convention on Biological Diversity (UNEP/CMS Secretariat, May 2000)

³ 2010 target "achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national levels as a contribution to poverty alleviation and to the benefit of all life on Earth" CBD, 2010 TARGET (Sixth Meeting of the Conference of Parties to the Convention on Biological Diversity, April 2002)

⁴ Elder D and Pernetta J, ATLAS OF THE OCEANS (Chancellor Press, London, 1996)

Species and populations are biodiversity's basic building blocks and traditional or terrestrial biodiversity management systems have invested heavily in the development of methods of site protection and corridors to maintain terrestrial biodiversity levels. However, the complexity and interconnectivity of marine ecosystems have proven poorly suited to site specific or isolated management. When the challenge is faced of also considering multiple, cumulative and synergistic threats across whole migratory marine ranges of animals traversing the world's oceans other measures must be employed.

Migratory species are "the living threads that tie or link widely scattered ecosystems together"⁵ They provide a living connection between ecosystems, forming an inter-dependence between areas often separated national borders or indeed whole oceans. This characteristic means they can also act as a focus for the coordination of conservation activities in multiple jurisdictions, focusing activity and responsibility in a tangible way.

Two groups of migratory marine species provide interesting case studies to consider in the context of a migratory range approach being applied to conservation in the marine environment. Cetaceans and marine turtles face a wide range of threats in a rapidly changing world. As highly migratory species occurring over the global commons and as well as within multiple national jurisdictions, cetaceans and marine turtles are particularly vulnerable to change in their critical and often little understood habitats. Both groups are long lived predators whose health often reflects the system in which they live, and can be useful as flagship species⁶ to focus management and as indicators of ecosystem health.⁷

Migratory marine species are often difficult to monitor because their range is usually vast and their activities often occur below the ocean surface where they are masked from human view. Research and monitoring of marine ecosystems is often expensive and physically prohibitive. Many species live their entire lives in deep oceanic realms that are rarely visited by humans and are also poorly understood. Our understanding of cetaceans and marine turtles is no exception to this monitoring dilemma, although we have collected enough data that the status of many populations already gives cause for concern. 11 cetacean populations are now listed on CMS Appendix I, which categorises them as endangered and requiring strict protection by member States. A further 39 cetacean populations are listed on CMS Appendix II signifying that they would benefit from inter-State cooperation for example through a regional Agreement or a Memorandum of Understanding (MoU). Similarly 8 marine turtle populations are listed on CMS Appendix I and 3 marine turtle populations on CMS Appendix II.⁸

However, as more visible flagship species, cetaceans and marine turtles, can also play an important role in providing linkages between marine ecosystems, maintaining complex relationship between flora and fauna otherwise not linked in human management systems. The conservation of these linking species and the critical habitats on which they depend can benefit the biodiversity throughout their range. They can be used as an ecological indicator of the health of the marine environment, and conservation activities based around their needs can provide solid net gains for biodiversity conservation.

Marine turtles and cetaceans can also be used to spearhead successful public marine education, help forge a positive community identity and have already proven themselves as valuable assets for planning, promoting and implementing initiatives such as protected areas or on-ground conservation activities. Often their popularity can be harnessed to extend management and increase funding, thereby bringing larger areas of the ocean under ecosystem-based conservation initiatives.⁹

⁵ Glowka L op cit at 2

⁶ A flagship species is a species that can function as an ambassador, icon or symbol for a defined habitat or issue. By focusing on, and achieving conservation of that species, the status of many other species which share its habitat – or are vulnerable to the same threats - may also be improved. Ref WWF, HOW WWF CLASSIFIES SPECIES (WWF Global Species Programme, 2005) at http://www.panda.org/species/WWF_classification

⁷ Hooker S and Gerber LR, *Marine Megafauna as a Tool for Ecosystem-based management: The Potential Importance of Megafauna* in BIOSCIENCE (Vol 54, No 1, January 2004); Worm B, Lotze HK and Myers RA, PREDATOR DIVERSITY HOTSPOTS IN THE BLUE OCEAN (PNAS, Vol 100, No 17, August 2003); Roberge JM and Angelstam P, USEFULNESS OF THE UMBRELLA SPECIES CONCEPT AS A CONSERVATION TOOL (Conservation Biology, Vol 18, No 1, February 2004)

⁸ CMS, *Appendix I and II*, Convention on the Conservation of Migratory Species of Wild Animals (Bonn, 2002)

⁹ Hoyt, E. MARINE PROTECTED AREAS FOR WHALES, DOLPHINS AND PORPOISES: A WORLD HANDBOOK FOR CETACEAN HABITAT

By basing conservation initiatives around the ecological needs of migratory flagship species, such as marine turtles and cetaceans, a migratory range approach is developed that is able to address the multiple, cumulative and synergistic impacts faced by these species and can assess and protect habitat critical to survival, while weaving a fabric of conservation measures across many jurisdictions, coordinating local, regional and international efforts and maximising the outcomes for all concerned.

During the Sixth Meeting of the Conference of Parties to the Convention on Biological Diversity (CBD) a Global Biodiversity Challenge was set to “achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national levels as a contribution to poverty alleviation and to the benefit of all life on Earth”.¹⁰ Specific indicators proposed by the CBD Conference of Parties that can be used to demonstrate a measurable achievement of this target include:

- *Trends in extent of selected biomes, ecosystems and habitats*: noting that this is likely to have a significant impact on certain species that are associated with particular biomes, ecosystems and habitats.
- *Trends in abundance and distribution of selected species*: noting that CMS should be well placed to provide information relating to migratory species.
- *Change in status of threatened species*: noting that a significant number of migratory species are under threat in at least some part of their range.
- *Coverage of protected areas*: because of the potential for analysis of the coverage of key areas for migratory species by protected areas.
- *Connectivity/fragmentation of ecosystems*: because of the impact that fragmentation and lack of connectivity can have on migratory species.¹¹

Each of these areas is directly applicable to the migratory range approach, in that the conservation of species and their habitat and the monitoring of those species and the ecosystems on which they depend is of direct relevance to these indicators and the 2010 target.

CMS can already contribute to the CBD workplan in the delivery of the ecosystem approach as it relates to migratory species and the usefulness of these species as indicators.¹² CBD has recognised the potential of integrated single species and ecosystem approaches in dealing with complex situations.¹³

2. Overcoming the challenges of migratory marine species conservation

Migratory marine species conservation faces some complex challenges. The range of a migratory species can often cross many jurisdictions and the threats they face during migration and within their critical habitats are often multiple, cumulative and synergistic in nature.

Not surprisingly, to date, most marine species conservation initiatives have been declared within State jurisdictions because of the complications associated with high seas management. Increasing recognition is now applied to the fact that many migratory marine species and their habitats also need protection on the high seas and between multiple national jurisdictions,¹⁴ reinforcing the need to

CONSERVATION (Earthscan, London, 2004); Prideaux M, SMALL CETACEANS AND WORLD POLITICS: DEVELOPING REGIMES FOR SPECIES SURVIVAL (University of South Australia, 2003)

¹⁰ CBD op cit at 3

¹¹ CMS Scientific Council, THE CMS AND THE 2010 GLOBAL BIODIVERSITY CHALLENGE (CMS/Sc12/Doc.17, 12th Meeting of the CMS Scientific Council, Glasgow, Scotland, 2004)

¹² CBD SBSTTA 6, *Recommendation VI/8 MIGRATORY SPECIES AND COOPERATION WITH THE CONVENTION ON THE CONSERVATION OF MIGRATORY SPECIES OF WILD ANIMALS* (Sixth Meeting of the Subsidiary Body on Scientific, Technical and Technological Advice - Montreal, Canada, March 2001)

¹³ CBD SBSTTA 5, *Recommendation V/10 ECOSYSTEM APPROACH: FURTHER CONCEPTUAL ELABORATION* (Fifth Meeting of the Subsidiary Body on Scientific, Technical and Technological Advice, Montreal, Canada, January/February 2000)

¹⁴ Cripps S and Christiansen S, *A strategic approach to protecting areas on the high-seas* presented at MARINE PROTECTED AREAS ON THE HIGH SEAS – SCIENTIFIC REQUIREMENTS AND LEGAL ASPECTS (Vilm, Germany, 2001); A number of conventions already provide the precedent for the designation of protected areas as part of an international agreement within territorial waters or Exclusive Economic Zones (EEZs). These include, but are not limited to, the Convention on Natural Protection and Wildlife Preservation in the Western Hemisphere, the African Convention on the Conservation of Nature and Natural Resources, and the Convention on the Conservation of European Wildlife and Natural Habitats (Berne Convention). With a specific focus on migratory birds, the Berne Convention places a strong emphasis on the protection of habitats and in some areas prohibits deliberate damage of breeding or resting sites. Ref Lyster S, INTERNATIONAL WILDLIFE LAW: AN ANALYSIS OF INTERNATIONAL TREATIES CONCERNED WITH THE CONSERVATION OF WILDLIFE (Cambridge University Press, Cambridge, 1993)

develop systems such as the migratory range approach to conservation that can be considered and understood across all of the jurisdictions necessary.

Many cetaceans and all marine turtles are highly migratory, crossing multiple jurisdictional boundaries in their annual or cyclic migrations. Their habitat needs extend as far as their migration routes. No single nation, in isolation, can manage the full range of issues they experience. Cooperative management within and between regions, through systems such as migratory range approach, are required to protect the species and the habitats on which they depend.

Regional initiatives are often more successful for a range of reasons. Countries within defined geographical areas have historical experiences in common. There are often well developed socio-cultural, political or economic linkages that distinguish them from the rest of the global community. Regions also often have already developed organisations to manage crucial aspects of their collective affairs. These dimensions are frequently interrelated, and negotiations within these contexts can be rapid and well targeted.¹⁵ Regional initiatives that consider the migratory range of a species can be both tailored to the local need and political context. In this way they are often able to maximise output, where negotiating global treaties may flounder and, because of isolation, where single State management may be insufficient.

In contrast global negotiations often fail to accommodate the full range of socio-cultural, political or economic differences and can take many years to negotiate. By focusing on regions rather than the globe, issues such as compliance, capacity building and participation can be more appropriately addressed, providing the opportunity for similar or connected countries to develop regulatory measures that both match their abilities and their cultural perspective.¹⁶

As evidence of CMS's inherent ability to address regional needs, six legally binding regional and global Agreements have been concluded under the CMS umbrella so far. A further seven CMS MoUs have also been developed. Two regional instruments in particular demonstrate the flexibility of CMS and its inherent ability to coordinate a migratory range approach in the marine environment - the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS) and the Memorandum of Understanding on the Conservation and Management of Marine Turtles and their Habitats of the Indian Oceans and South-East Asia (IOSEA Marine Turtle MoU). While both are young instruments, and only time can comment on their on-going effectiveness, each instrument has been able to develop regionally specific, well targeted conservation plans that have led to tangible on-ground action that can be both monitored and measured, revealing a migratory range approach that offers great potential for species and environment conservation.

3. The importance of considering critical habitat

Reiterating an earlier point – that migratory species are “the living threads that tie or link widely scattered ecosystems together”, the conservation of these linking species and the critical habitats on which they depend can also benefit the biodiversity throughout their range. When looking to put in place protective mechanisms for specific species, populations or groupings of species, safeguarding habitat that is critical to their survival is important.¹⁷ It is likely to be more critical with evolved or complex species that may have strong identification with areas and conditions.¹⁸

The science and policy definitions of ‘critical habitat’ differ slightly. This science of critical habitat speaks to precise and defined species, and often population, specific needs. Whereas a policy

¹⁵ Chayes A and Chayes A, *THE NEW SOVEREIGNTY: COMPLIANCE WITH INTERNATIONAL REGULATORY AGREEMENTS* (Harvard University Press, Cambridge, 1995); Mann Borgese E, *OCEANS GOVERNANCE AND THE UNTIED NATIONS* (Centre for Foreign Policy Studies, Dalhousie University, Halifax 1996)

¹⁶ Prideaux op cit at 9

¹⁷ Agardy T, *Marine Protected Areas and Ocean Conservation* (Academic Press London, 1997)

¹⁸ Reeves and Leatherwood have urged greater attention be paid to cetacean protected areas and have stated the importance of protecting critical habitat and restricting human activity within these areas. Ref Reeves R and Leatherwood S, *DOLPHINS, PORPOISES AND WHALES: 1994 – 1998 ACTION PLAN FOR THE CONSERVATION OF CETACEANS* (IUCN/SSC Specialist Group: International Union for the Conservation of Nature and Natural Resources, Gland, 1994)

perspective on critical habitat, as used by this paper, refers more generally to those parts of a range, for either a whole species or a particular population of that species, that are essential for survival, as well as for establishing and maintaining a healthy population growth rate. Areas that are regularly used for feeding (including hunting), breeding (all aspects of courtship) and raising young, as well as areas or conditions used for socialization and for communication, are all essential critical habitat, especially if these are always or regularly used.¹⁹

3.1 Cetaceans

Between species, cetacean habitat needs are known to be diverse. Riverine and many coastal cetaceans have more restricted ranges, whereas marine cetacean habitats are often defined by oceanic characteristics rather than geography. Many cetacean species are highly pelagic, living their entire lives in the high seas.

Unlike land-based critical habitat, marine critical habitat boundaries may be less fixed. For many cetacean species, these critical habitats may relate to conventional geographical areas, whereas for other species, critical habitat may be defined by more 'fluid' oceanographic parameters including temperature, salinity, and current, such as the less fixed feeding areas that are dependent on upwellings or other ever-changing oceanographic conditions.²⁰ The temperature of the water also seems to strongly influence which species are found within a region. Cold, warm and tropical water species are recognised with distinct, and sometimes overlapping, distributions.²¹ Some species use more than one primary habitat during different parts of their migration, including the many large whales that breed in warm tropical waters but feed, after long migrations, in polar seas. Other species such as the orca may well use multiple habitats as they follow prey along a migration route.

Many cetacean species inhabit vast marine regions and some are thought to have movements between populations on a regular basis, whereas other populations remain more distinct. Overlapping migrations may occur, but specific populations may remain isolated from each other.²² Increasingly, cetacean critical habitat is being recognised, although conservation mechanisms are slow to evolve and mitigate threats posed in these areas or conditions.

3.2 Turtles

The importance of maintaining the integrity of diverse habitats critical for marine turtle nesting, feeding and development is equally important and poses an additional complexity in that marine turtles require both marine and terrestrial (beach/nesting) habitats within their lifecycles.

Marine turtles have complex life cycles where individuals move among many habitats and travel across vast ocean basins, but comparatively little is known of their lifecycles and biology beyond nesting beaches. All marine turtles appear to migrate at different times in their lives and journeys spanning many thousands of kilometers have been documented. Their complex developmental migrations carry them through a number of habitat types. Reproductive migrations between feeding grounds and nesting beaches are the best documented because of the ease of tagging adult females on nesting beaches.²³ The seasonal movements of marine turtles in search of food may also be considered as migrations. These complex migrations of these species and the apparent variable residence times result in poorly understood distribution patterns with turtles from various nesting populations intermingling on foraging grounds. Their critical habitats will include pelagic and benthic foraging areas, mating and inter-nesting habitats, and migratory corridors that are used by turtles when moving among these habitats.²⁴

¹⁹ Hoyt op cit at 9

²⁰ Reeves et al, op cit at 1

²¹ The links between the relationships of cetaceans and open ocean oceanography has not been well studied in many areas of the world. However it is known that different species are found according to water depth, temperature and productivity level and not in areas that lack one or all of those characteristics. Ref Jefferson T, Leatherwood S and Webber M, MARINE MAMMALS OF THE WORLD (United Nations Environment Programme/Food and Agricultural Organisation of the United Nations, 1993)

²² Reeves and Leatherwood S op cit at 18

²³ Meylan A and Meylan B, *Introduction to the Evolution, Life History, and Biology of Sea Turtles* in RESEARCH AND MANAGEMENT TECHNIQUES FOR THE CONSERVATION ON SEA TURTLES (Eckert KL, Bjorndal KA, Abreu-Grobois FA and Donnelly M, eds, IUCN/SSC Marine Turtle Specialist Group Publication #4, 1999)

²⁴ Bjorndal KA, *Priorities for Research in Foraging Habitats* in RESEARCH AND MANAGEMENT TECHNIQUES FOR THE CONSERVATION ON SEA TURTLES (Eckert KL, Bjorndal KA, Abreu-Grobois FA and Donnelly M, eds, IUCN/SSC Marine Turtle Specialist Group Publication #4, 1999); Gibson J and Smith G, *Reducing Threats to Foraging Habitat* in RESEARCH AND MANAGEMENT

Although their nesting critical habitat need has been widely recognised in the conservation community and among other stakeholders, many such sites have been destroyed or degraded, resulting in the reduction of nesting populations, a decrease in reproductive success and survivability of many populations.

4. Applying a migratory range approach to protecting cetaceans and marine turtles

The loss of cetacean and marine turtle populations is felt by human communities in many ways, including the loss of valuable ecosystem services they provide; the foregoing of potential revenue for local communities through eco-tourism opportunities; and, of course, the elimination of a natural resource for those who depend on the sea for their nutrition and livelihood.²⁵

To assist States to reach the CBD 2010 target of “a significant reduction of the current rate of biodiversity loss at the global, regional and national levels as a contribution to poverty alleviation and to the benefit of all life on Earth”²⁶ biodiversity conservation measures could wisely embrace a migratory range approach to marine conservation.

Intrinsically the ecosystem approach recognises the full economic and ecological value of natural systems and understands that land or sea are not simply inert, but in a natural state provide an array of functions and services to the ecosystem as a whole and increasingly the value of this service or function is being legitimised through moral and legal consideration.²⁷

To achieve conservation at this level, by using migratory species as a flagship for conservation activity, migratory range approaches need to be adaptive, constantly reviewed and sensitive to signals from the wider environment and the flagship species that are their focus. Appropriate and adaptive management adjustment, as required in an ecosystem approach, should be advised by signals from both ecosystem and species monitoring, with the aim of considering ecosystem function over the long term.²⁸ Where knowledge is lacking, the precautionary principle should be invoked to protect the ecosystems which nourish all life and life processes in the sea. In some instances this may require a restriction of users that have access to some areas. In many areas critical habitat will need to be considered as a network of areas, with well managed buffer zones, rather than isolated reserves.²⁹ These goals are only possible with comprehensive planning.

TECHNIQUES FOR THE CONSERVATION ON SEA TURTLES (Eckert KL, Bjorndal KA, Abreu-Grobois FA and Donnelly M, eds, IUCN/SSC Marine Turtle Specialist Group Publication #4, 1999); Witherington BE, *Reducing Threats to Nesting Habitat in RESEARCH AND MANAGEMENT TECHNIQUES FOR THE CONSERVATION ON SEA TURTLES* (Eckert KL, Bjorndal KA, Abreu-Grobois FA and Donnelly M, eds, IUCN/SSC Marine Turtle Specialist Group Publication #4, 1999)

²⁵ Troëng S and Drews C, *Money Talks: Economic Aspects of Marine Turtle Use and Conservation* (WWF-International, Gland, Switzerland, 2004); Hoyt E, *WHALE WATCHING 2001: WORLDWIDE TOURISM NUMBERS, EXPENDITURES AND SOCIOECONOMIC BENEFITS* (IFAW, Yarmouth, Port, 2001); Reeves et al, op cit at 1; IUCN/SSC Marine Turtle Specialist Group, op cit at 1

²⁶ CBD, SIXTH MEETING OF THE CONFERENCE OF PARTIES TO THE CONVENTION ON BIOLOGICAL DIVERSITY (Sixth Meeting of the Conference of Parties to the Convention on Biological Diversity, April 2002)

²⁷ Cortner H and Moote M, *THE POLITICS OF ECOSYSTEM BASED MANAGEMENT* (Island Press, Washington, 1999); Hawken P, *THE ECOLOGY OF COMMERCE* (Weidenfeld and Nicolson, London 1993); When the indirect values of the world ecosystems such as natural capital stocks and critical functioning ecosystems are calculated, the numbers are startling. Costanza et al (1997) have calculated that ecosystems provide at least US\$33 trillion worth of services annually which are currently identified only outside the market system (externalised). The comparison between marine and terrestrial ecosystem value is calculated US\$20,949 : US\$12,319 trillion respectively, with ocean service including food production, nutrient cycling, and regulation of atmospheric chemical composition and nutritional regulations of populations. Many of the other services such as climate regulation, hydrological flow regulation, waste treatment, raw materials, and genetic resources have yet to be calculated, and so the already high value will undoubtedly increase markedly when this is included. Ref Costanza R, d'Arge R, de Groot R, Farber S, Grasso M, Hannon B, Limburg K, Naeem S, O'Neill R, Paruelo J, Raskin R, Sutton P and van der Belt M, *The value of the world's ecosystem services and natural capital* in *NATURE* (387, 1997); When proper account is taken of the values of natural areas and products, true sustainable management of these areas also makes economic sense Ref Costanza R and Daly H, *Natural Capital and Sustainable Development* in *CONSERVATION BIOLOGY* (6, 1, 1992)

²⁸ SBSSTA 5, op cit at 13; Ward T, Tarte D, Hegerl E and Short K, *ECOSYSTEM BASED MANAGEMENT FOR MARINE CAPTURE FISHERIES* (WWF, Gland, 2002); Leadbitter D, Ward T and Ridge K, *Maintaining Biodiversity in Sustainable Marine Fisheries – A review and scoping of future directions* (Department of Environment and Heritage, Canberra, 1999)

²⁹ Roberts C and Hawkins J, *FULLY PROTECTED MARINE RESERVES: A GUIDE*, WWF ENDANGERED SEAS CAMPAIGN (World Wide Fund for Nature, Washington, 2000)

CMS provides the tools to develop such a migratory range ecosystem based approach. It extends and profiles conventional domestic management out to international jurisdictions through the development of regional instruments that can, because of their inclusive nature and inherent flexibility, allow for flexible and adaptive regional ecosystem and species conservation.

Two CMS instruments demonstrate the migratory range approach in action and the tangible delivery of the CBD 2010 targets.

4.1 ACCOBAMS: Cetaceans as a flagship species to protect the Mediterranean and Black Seas

Cetaceans are warm-blooded intelligent mammals that live their entire lives in the sea. They live long, mature late, reproduce slowly, invest heavily in the upbringing and development of each offspring and engage in complex social environments.³⁰ Therefore, as long lived high order predators cetaceans can be utilised as indicators of ecosystem health, reflecting the impact of both cumulative and synergistic threats.³¹ While they are occasionally prey to other animals their ecological role, that has evolved over 50 million years, is high in the food chain. Their biology and reproduction have not evolved for fast replenishment.

The complexity of their social organisation³² adds an additional level of complication to the task of protecting their critical habitat. Cetacean 'culture' is gradually being recognised and has sparked a scientific and philosophical debate about the way in which these animals are regarded.³³ Evidence of culture and individual cognitive capacity is significant to habitat management decisions because it indicates that knowledge can be passed from one generation to the next by a means other than genetic inheritance.³⁴ Their role therefore in the biodiversity web becomes an interesting one. This brings a new consideration - the need to protect critical habitat where use of habitat is more than a simple instinctive response and may well be learned.

The health of many of the world's cetacean populations are threatened directly by bycatch, pollution, habitat destruction, over-fishing and climate change. Other threats include activities that may frighten, displace or harm these species such as underwater noise pollution from sources such as shipping traffic, wind farms, seismic surveys and military sonar. In some areas of the world, direct commercial cetacean hunts still persist. In a few regions, dolphin and porpoise bycatch has turned to directed nets or harpoon hunts by artisanal fishers.³⁵ The belief that cetaceans compete with fisheries or damage fishing nets has prompted culls in other regions.³⁶ The impact of these new directed hunts using fishing nets is not known as very little data is available on the targeted populations or the number of animals being caught.

³⁰ Whitehead H and Weilgart L, *The Sperm Whale: Social Females and Roving Males* in CETACEAN SOCIETIES: FIELD STUDIES OF DOLPHINS AND WHALES (Mann J, Connor R, Tyack P and Whitehead H eds. University of Chicago Press, Chicago 2000); Connor R, *Group Living in Whales and Dolphins* in CETACEAN SOCIETIES: FIELD STUDIES OF DOLPHINS AND WHALES (Mann J, Connor R, Tyack P and Whitehead H eds. University of Chicago Press, Chicago 2000); Whitehead H and Mann J, *Female Reproductive Strategies of Cetaceans: Life Histories and Calf Care* in CETACEAN SOCIETIES: FIELD STUDIES OF DOLPHINS AND WHALES (Mann J, Connor R, Tyack P and Whitehead H eds. University of Chicago Press, Chicago 2000); Baird R, *The Killer Whale: Foraging Specializing and Group Hunting* in CETACEAN SOCIETIES: FIELD STUDIES OF DOLPHINS AND WHALES (Mann J, Connor R, Tyack P and Whitehead H eds. University of Chicago Press, Chicago 2000)

³¹ Hooker and Gerber, op cit at 7; Reeves RR, THE VALUE OF SANCTUARIES, PARKS, AND RESERVES (PROTECTED AREAS) AS TOOLS FOR CONSERVING MARINE MAMMALS (Final Report to the Marine Mammal Commission, contract number T74465385. Marine Mammal Commission, Bethesda, MD, 2000); Hoyt op cit at 9

³² Samuels A and Tyack P, *Flukeprints* in CETACEAN SOCIETIES: FIELD STUDIES OF DOLPHINS AND WHALES (Mann J, Connor R, Tyack P and Whitehead H eds. University of Chicago Press, Chicago 2000); Mann J, Connor R, Tyack P and Whitehead H, CETACEAN SOCIETIES: FIELD STUDIES OF DOLPHINS AND WHALES (University of Chicago Press, Chicago 2000); Stroud C, *The Ethics and Politics of Whaling*, THE CONSERVATION OF WHALES AND DOLPHINS: SCIENCE AND PRACTICE (Simmonds M and Hutchinson J eds. John Wiley and Sons, West Sussex, 1996); Rendell L and Whitehead H, *Culture in whales and dolphins* in BEHAVIOURAL AND BRAIN SCIENCES, 24, 2 (2001)

³³ Fox M, *Cetacean Culture: Philosophical Implications* in BEHAVIOURAL AND BRAIN SCIENCES, 24, 2 (2001); Rendell L and Whitehead H, *Cetacean culture: Still afloat after the first naval engagement on the culture wars* in BEHAVIOURAL AND BRAIN SCIENCES, 24, 2 (2001)

³⁴ Whitehead H, *Cultural Selection and Genetic Diversity in Matrilineal Whales* in SCIENCE, 282 (7 November 1998); Norris S, *Creatures of Culture? Making the Case for Cultural Systems in Whales and Dolphins* in BIOSCIENCE, 52, 1 (2002); Bower B, *Culture of the sea* in SCIENCE NEWS, 158, 18 (2000)

³⁵ For comprehensive documentary analysis of these threats see Simmonds M and Hutchinson J, THE CONSERVATION OF WHALES AND DOLPHINS: SCIENCE AND PRACTICE (John Wiley and Sons Ltd, New York, 1996); Prideaux op cit at 9; Reeves and Leatherwood op cit at 18

³⁶ Reeves et al, op cit at 1

To address these issues within a regional area that both encapsulates the migratory range of a number of cetacean species and provides for the protection of important critical habitat, the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS) has grown as the second Agreement for cetaceans under CMS. It is the first Agreement of its kind to bind the countries of these two sub-regions to work together on a problem of common concern. The first Meeting of the Parties was held in Monaco February/March 2002.

The purpose of ACCOBAMS is to reduce threats to cetaceans in the Black Sea, the Mediterranean and the Atlantic coasts of North Morocco and South Portugal. There are at least eighteen different cetacean species inhabiting the Mediterranean Sea, many are genetically distinct from their Atlantic counterparts. In the Black Sea there are at least three cetacean species isolated from the Mediterranean populations. The ecosystems within the ACCOBAMS region are highly changed and disturbed, primarily due to pollution, coastal development, extensive vessel traffic, over-fishing and the impacts of introduced species. Cetaceans are highly affected by the activities of a range of countries operating in this semi-enclosed marine system.³⁷

The aim of the Agreement is to promote close cooperation between Parties with a view to achieving and maintaining a favourable conservation status for all species of cetaceans present in the area. Significantly, membership is also open to non-coastal States of the Agreement area ("third countries") whose vessels are engaged in activities that may affect cetaceans. From the beginning, ACCOBAMS involved in its work most of the Range States to the Agreement and developed a close collaboration with non-governmental organisations and scientific community, granting these organisations a status of ACCOBAMS 'Partner'.

The ACCOBAMS Action Plan obliges Parties to address the following measures for the conservation of cetaceans:

- Adoption and enforcement of national legislation
- Assessment and management of human-cetacean interactions
- Habitat protection
- Research and monitoring
- Capacity building, collection and dissemination of information, training and education
- Responses to emergency situations

In response, the ACCOBAMS has developed a comprehensive conservation and management plan. This plan has determined that while various threats, such as incidental catch and pollution, are of serious concern, pressure might be most intense on coastal species, such as common dolphins where in some areas a dramatic decline in the past decades has been monitored. However, pelagic species, such as sperm whales and striped dolphins, can also be severely affected.

4.2 ACCOBAMS Action Plan and the specific CBD 2010 target indicators

Each of these priority areas within the ACCOBAMS Action Plan, and the use of cetaceans as flagship species, contribute to the ability of the region to meet its 2010 targets, by providing important baseline information, addressing threats in common to other species and biodiversity conservation programmes and through the creation of protected area that have both a significant conservation role and can also help to focus local communities on the wider conservation work associated with ACCOBAMS.

1. Trends in extent of selected biomes, ecosystems and habitat and 2. Connectivity/ fragmentation of ecosystems:

The Working Programme 2005-2007³⁸ plans for the collection of systematic information of cetacean diet and investigating the application of trophic modeling to facilitate understanding cetacean population roles within trophic food webs.

³⁷ Notarbartolo di Sciarra G (Ed.), CETACEANS OF THE MEDITERRANEAN AND BLACK SEAS: STATE OF KNOWLEDGE AND CONSERVATION STRATEGIES (A report to the ACCOBAMS Secretariat, Monaco, February 2002)

³⁸ ACCOBAMS, *Resolution 2.7 MoP2/Doc 23 rev2*, WORKING PROGRAM 2005 – 2007 (ACCOBAMS Second Meeting of the Parties, Palma de Mallorca, November 2004)

3. Trends in abundance and distribution of selected species:

The Working Programme has determined that scientific research in the Agreement area remains essential to identify the populations having the least favorable conservation status and to assist the Parties to address the conservation priorities.

4. Change in status of threatened species:

Comprehensive cetacean population estimates and distribution within the ACCOBAMS Area are an ongoing priority. The Working Programme aims to continue with dedicated surveys, genetic studies and the creation of a sightings database to ensure that baseline populations estimates and foundation information is available for policy development. Drafting of a Mediterranean Sea common dolphin conservation plan has been completed and a Black Sea cetaceans and Mediterranean bottle dolphin conservation plans are being developed. These plans will follow with the remaining identified species including sperm whales, fin whales, and harbour porpoise.

Threats interactions for cetacean and their habitats are being addressed through specific programmes including the development of a stranding networks and system of tissue banks and plans for the implementation of a comprehensive programme addressing bycatch and depredation; the evaluation of the impact of anthropogenic noise and ship collisions in the Agreement area; the creation of an emergency task force; as well as guidelines and programmes to support a sustainable whale watching industry. Each of these measures will enable ACCOBAMS to both map the human use of ecosystems and habitats in the Agreement area but also to develop mitigation measures that will enhance the regions species recovery.

5. Coverage of protected areas:

The protection of habitats in within the ACCOBAMS region is a core area for development. The Scientific Committee is engaged in a programme developing criteria for the selection of sites, collection of key information of cetacean critical habitats and detailed investigation of these sites in order to develop formal proposals for consideration.

Although the Action Plan was not developed with the 2010 targets as it focus, it is clear that it has a very clear contribution to make, while delivery tangible on-ground conservation outcome through a migratory range approach.

4.3 IOSEA Marine Turtle MoU: using marine turtles as a flagship species to protect the marine environment within the Indian Ocean and South-East Asian region

With a few exceptions, most of the world's marine turtle populations have declined. Some have been eliminated almost completely. Marine turtles are a long-lived species that mature late in life. As highly migratory species they frequently travel hundreds or even thousands of kilometers between foraging and nesting grounds, spending their lives at sea but returning to land to reproduce. Adult females nest in multiyear cycles, coming ashore several times to lay hundreds of eggs during a nesting season. After about 50 to 60 days of incubation, the hatchlings emerge and head for the ocean to begin life as pelagic drifters. While maturing over the course of several decades, they move in and out of a variety of ocean and coastal habitats. Survival to adulthood is low.³⁹ Current threats, causing significant turtle mortality in recent decades, include widespread exploitation for eggs and meat, bycatch, destruction and degradation of critical habitats, pollution, and inappropriate management practices.⁴⁰

In the context of sustainable development, the conservation and management of marine turtles globally and within the Indian Ocean - South-East Asian region presents a formidable challenge. Many communities still utilise marine turtles for their meat and eggs, as a source of protein, and their shell for traditional crafts. At the same time, marine turtles have both intrinsic and ecological values as important components of marine ecosystems.

Threatened or endangered in many parts of the world, marine turtles are considered as flagship species on which to base interventions aimed at protecting habitats of importance for a myriad of other marine

³⁹ IUCN/SCC Marine Turtle Specialist Group, op cit at 1

⁴⁰ *ibid*

species. The IOSEA Marine Turtle MoU is one of seven MoUs under CMS. The MoU area covers 41 Range States, and applies to the waters and coastal States of the Indian Ocean, South-East Asia and adjacent seas, extending eastwards to the Torres Strait. For implementation purposes, the area is divided into four sub-regions: South-East Asia and Australia, Northern Indian Ocean, Northwestern Indian Ocean, and Western Indian Ocean. The Signatory States held their first meeting in Bangkok in January 2003.

The MoU puts in place a framework through which States of the Indian Ocean and South-East Asian region, as well as other concerned States, can work together to conserve and replenish depleted marine turtle populations for which they share responsibility. This objective will be achieved through the collective implementation of the Conservation and Management Plan.

The MoU has a comprehensive Conservation and Management Plan contains 24 programmes and 105 specific activities. It focuses on:

- reducing threats,
- conserving critical habitat,
- exchanging scientific data,
- increasing public awareness and participation,
- promoting regional cooperation, and
- seeking resources for implementation.

4.4 IOSEA Marine Turtle MoU Conservation and Management Plan and the specific CBD 2010 target indicators

Each of these focus areas within the MoU's comprehensive Conservation and Management Plan, and the use of cetaceans as marine turtles species, contribute to the ability of the region to meet its 2010 targets, by providing important baseline information, addressing threats in common to other species and biodiversity conservation programmes.

The CMP also identifies the core need to increase public awareness about the threats to marine turtles and their habitats, and to enhance public participation in activities. This is achieved through public education programmes; the development of alternative livelihood opportunities for local communities; and by encouraging community participation in conservation efforts⁴¹

By also addressing the need to increase cooperation between national, regional and international fora, the Conservation and Management Plan will assist States to build capacity that can strengthen and improve enforcement measures; to regulate and share information on trade, to combat illegal trade, and to cooperate in enforcement activities relating to marine turtle products; to develop and implement national, sub-regional and regional action plans for the conservation and management of marine turtles and their habitats; and to enhance mechanisms for cooperation and promote information exchange.⁴²

1. Trends in extent of selected biomes, ecosystems and habitat and 2. Connectivity/ fragmentation of ecosystems:

The Conservation and Management Plan sets out an agenda of studying of marine turtles and their habitat with specific emphasis on the development of baseline studies. A Marine Turtle Interactive Mapping System (IMapS) is also being developed to ensure the appropriate exchange of information throughout the region.⁴³

3. Trends in abundance and distribution of selected species:

A major emphasis on investigating and then mitigating the direct threats to these animals throughout the region is a major aspect of activity under the Conservation and Management Plan. The commitment to monitoring and information exchange will improve understanding of marine turtle

⁴¹ CMS, IOSEA MARINE TURTLE MOU CONSERVATION AND MANAGEMENT PLAN (CMS, Memorandum of Understanding on the Conservation and Management of Marine Turtles and Their Habitats of The Indian Ocean and South-East Asia, Manila, June 2001)[here-in-after IOSEA Marine Turtle MoU CMP]

⁴² *ibid*

⁴³ CMS, Memorandum of Understanding on the Conservation and Management of Marine Turtles and their Habitats of the Indian Ocean and South-East Asia. (Convention on the Conservation of Migratory Species of Wild Animals, Manila, June 2001); CMS, REPORT OF THE SECOND MEETING OF SIGNATORY STATES (CMS Memorandum of Understanding on the Conservation and Management of Marine Turtles and Their Habitats of The Indian Ocean and South-East Asia, Manila, June 2001)

ecology and populations throughout the region and ensure that protection mechanisms are well targeted. Reference material is being compiled and centrally located to enable more efficient information sharing.⁴⁴

4. Change in status of threatened species:

Baseline studies on marine turtles and their habitats are a key priority. In seeking to reduce direct and indirect threats to marine turtles, the Conservation and Management Plan has recognized the need to identify, document and then minimise these threats to marine turtle populations and their habitats. Specific programmes include correcting the adverse economic incentives that threaten marine turtle populations; reducing incidental capture and mortality of marine turtles in fishing activities; prohibiting direct commercial harvest and domestic trade of marine turtles, their eggs, parts or products, whilst allowing exceptions for traditional harvest by communities within each jurisdiction; and developing nesting beach management programmes to maximize hatchling recruitment.⁴⁵

5. Coverage of protected areas:

Another key part of the Conservation and Management Plan is to protect, conserve and rehabilitate marine turtle habitats. Networks of protection sites are proposed throughout the region. In addition to creating more awareness and recognition of the individual sites, selected according to agreed criteria, the network will promote joint research, training and educational activities. An important element of the proposal will be to assess management effectiveness and monitor progress over time using appropriately adapted tracking tools.⁴⁶

Each of these measures will bring tangible benefits to the communities that interact with marine turtles in this region, assisting with the growth of economic opportunities and at the same time providing a migratory range approach to the management of the marine environment on which the turtles and human communities depend. The focus data and management measures will enable policy makers to make more informed choices about consumptive and non-consumptive uses of marine turtles in the region, noting that non-consumptive uses generally create greater and more diverse gross revenue, greater job opportunities for local communities and engenders stronger commitment for conservation efforts,⁴⁷ but requires investment to build infrastructure to which in turn requires policy security before commitments can be made to commence any programmes. This policy investment in turn will provide a benefit to other areas of marine management, such as fisheries that are seeking to mitigate damaging practice, coastal development that is seeking to avoid critical habitat areas and unsustainable trade in turtle products within and outside of the region.

5. A passport to 2010 through a migratory range approach

Through these two cases it is evident that a migratory range approach can contribute to on-ground tangible conservation as well as to State commitments to the 2010 Global Biodiversity Challenge.

The cumulative nature of the threats faces by species in the marine environment means that single issue specific management is no longer appropriate. By protecting the critical habitats of migratory species across their migratory range, and by underpinning this protection with conservation mechanisms that consider and address the multiple, cumulative and synergistic threats to the species themselves and the ecosystems on which they depend, a migratory range approach emerges that offers great potential for species and environment conservation.⁴⁸ Species based and ecosystem based conservation can compliment each other and this approach both facilitates greater cooperation between States, but also assists in the delivery of biodiversity conservation obligations.

⁴⁴ IOSEA Marine Turtle MoU CMP op cit at 41

⁴⁵ *ibid*

⁴⁶ *ibid*; Trono R and Cantos JA, Conserving Migratory Species Through Ecoregion Conservation approach: The Case of Sea Turtles in Sulawesi Marine Ecoregion (Tropical Coasts, December 2002); CMS, REPORT OF THE SECOND MEETING, op cit at 43

⁴⁷ Troëng and Drews op cit at 25

⁴⁸ Glowka op cit at 2

The two case studies considered in this paper – ACCOBAMS and the IOSEA Marine Turtle MoU – have demonstrated the potential of the migratory range approach and well as CMS’s inherent flexibility that can form links between individuals and groups of migratory species, their habitats and the other components of biodiversity they depend on and interact with. This ability and this approach intersect directly with CBS’s provisions and offer a passport to 2010.

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