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Abstract / Summary
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BUILDING A MARINE PROTECTED AREAS NETWORK TO PROTECT ENDANGERED SPECIES: WHALE CONSERVATION AS A TOOL FOR INTEGRATED MANAGEMENT IN SOUTH AMERICA

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ABSTRACT: *An initiative to strengthen the effectiveness of Marine Protected Areas and endangered species conservation is presented, exploring concepts and parameters that lead to the integration between MPA management and conservation measures for large cetaceans through the establishment of a regional network in South America.*

1. INTRODUCTION

Along their history, protected areas (PAs) have evolved through different conservation objectives, a process which is evidenced by the nomenclatural evolution of the management categories defined by IUCN and by national systems. This dynamic process has demonstrated the need to change the scope of traditional approaches, integrating other concepts and actions to improve community awareness and engagement, and therefore, the effectiveness of the protective role of these areas.

On the other hand, programs for species conservation, which historically began later than the creation of PAs, have been showing in the last decades a faster evolution in their effectiveness. Particularly, this has become evident referring to Marine Protected Areas (MPAs), in which the protection awarded to endangered and/or threatened species has been demonstrating to be more effective in involving the community at large, making the need for protecting entire ecosystems more understandable for common people. 'Flagship species', such as whales, become a good example of an effective approach to raise public awareness towards MPAs.

The connectivity among marine areas provided by the very nature of the oceans – considering specially the role played by currents and other oceanographic processes - makes it easier to understand the oceanic environment as a wide universe, an approach not adequately covered by a site-focused management.

Connectivity is defined by NRC (2001) as 'the capacity for one site to "seed" another location through the dispersal of either adults or larvae to ensure the persistence and maintenance of genetic diversity for the resident protected species'. This definition directly introduces the concept of connectivity as resulted from a variety of physical and biological influences.

Recognizing connectivity as the whole set of linkages provided either by physical or biological factors within the marine environment, as well as between the sea and the coastal areas, is essential for proper planning and management of MPAs and for species conservation measures. Besides of currents, wind drifts and animal migrations link distant regions of the ocean, being responsible for the transportation (or displacement, in the case of migrating species) of nutrients, food, pollutants,

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larvae and migratory adult species across oceans, transcending biogeographic provinces and political boundaries (Salm *et al*., 2000).

It is widely recognized that oceanic and coastal environmental patterns and ecological processes and living organisms - in their immense diversity in both taxonomic and ecological terms - can hardly be understood, let alone protected, in restricted geographical spaces. Thus, the traditional approach to the establishment and management of protected natural areas, while relatively successful in continental land environments, has failed short of providing a comprehensive framework for marine conservation, leading to the need to develop broader approaches which take into account also the ecosystem functions.

MPAs can conserve entire ecosystems that are unique, particularly rich in species, representative of biogeographical units, and/or contain habitats that are critical to ensure the survival of certain species (Salm *et al.*, 2000; Halpern & Warner, 2002). Particularly for whale protection, the establishment of MPAs - and currently of networks of MPAs – is seen as essential means of ensuring conservation measures, once MPAs can be viewed as cores for action.

In this paper, we discuss how a network of MPAs can be more effective for whale conservation in South America, and how whales – as 'flagship species' – can be a tool for raising awareness about the role of MPAs.

2. CONCEPTUAL LINKAGES

2.1. MPA Networks and species conservation

NRC (2001) considers that single MPAs will frequently be insufficient to meet multiple needs within a region and that it will be necessary to establish networks of MPAs forming an array of sites with an ability to support each other based on connectivity. The concept of a network of MPAs is developed further by Sala *et al*. (2002) who describe a general model for designing networks of marine reserves. Optimization algorithms were used to analyse the location size and connectivity of marine reserves in the Gulf of California. The authors suggest that similar approaches could be developed to incorporate other factors, including marine mammals, to obtain networks of reserves to preserve all marine biodiversity (Leaper *et al.* 2003).

Networks of MPAs can accommodate the needs of many whale species that migrate during their life histories in search of food, mating and calving grounds, or even of resident species that simply depend on critical habitats. At the same time, a network of MPAs may become a marine corridor which can promote the notion of linking management actions, developing bold initiatives for determining relevant areas to extend protection to, and raising community awareness in or near marine and coastal protected areas in relation to their responsibility as stewards of a shared heritage.

Species and community protection as related to MPAs are supported by the declaration of protected areas over critical habitat, as reinforced by Article 8 of the Convention on Biological Diversity, which call the States to '*establish marine protected areas for conservation and sustainable use of threatened species, habitats, living marine resources and ecological processes*'. Moreover, the UN Food and Agricultural Organisation (FAO)[3] acknowledges the importance of MPAs in a broader view which considers influences within an ecosystem, recognizing protection as a transboundary

[3] FAO, 2000 – The State of World Fisheries and Aquaculture (Rome, 2000), at www.fao.org/docrep

characteristic: '*Marine reserves represent an important tool to be used in conjunction with other appropriate management measures (…) also for providing a baseline state for monitoring. To be effective, reserves have to cover a relatively large proportion of the ecosystem at the regional level'.*

2.2. **MPAs and conservation of large cetaceans**

Areas that are regularly used by whales for feeding, breeding, raising calves, socialization and migrating are all essential critical habitats that require protection for long-term species survival. A growing effort to protect broad areas for whale conservation is being developed in the recent years through the creation of regional Sanctuaries, such as the Southern Ocean Sanctuary in 1994, and the proposal of new ones, such as the South Atlantic Whale Sanctuary (Palazzo *et al*., 2003).

At its annual meeting in 2002 the Scientific Committee of the International Whaling Commission noted that, for future its work, some mechanisms by which sanctuary proposals and their review process would benefit should be developed, including: (1) reviewing IWC sanctuaries in combination when biologically relevant; and (2) introducing MPA scientific concepts into sanctuaries and sanctuary proposals (Leaper, *et al.*, 2003). The term "sanctuary" can mean a number of different things, depending on the context and there is no generally agreed definition, although the protection that sanctuaries may offer to whales is based on MPA concepts. For example, it has been suggested that the 13 designated National Marine Sanctuaries in the US might be better referred to as 'multiple-use resource management areas' (NRC, 2001). Article V of the 1946 ICRW refers to adopting regulations with respect to fixing 'open and closed waters, including the designation of sanctuary areas' suggesting the intent of a sanctuary to be more than just an area closure (Leaper *et al.*, *op.cit.*).

Despite the growing knowledge of the threats to cetaceans, their protection has been featured in less than 3% of protected areas worldwide (Hoyt, E. *apud* Prideaux, 2003). Paradoxically, whales have an immediate, universal and undeniable appeal in the minds of people be they professionals involved in conservation, politicians, journalists or almost any ordinary citizen, regardless of geographical or political divides. The plight of the great whales to survive the turbulent history of modern whaling has made them known as important, magnificent yet fragile components of our marine environments which are worth preserving. Thus, whales emerge as a natural example to represent the idea of inter-relationship and linkage among distant habitats, and to give visibility to the need for Marine Protected Areas, something commonly referred to as the phenomenon of 'flagship species'.

In this sense, the need to protect whales in MPAs – and especially in a network of MPAs - can generate means to strengthen the role of protected areas and the need to standardize crucial actions, such as enforcement, as well as the need to harmonize regulations for harmful activities like unselective or otherwise destructive fishing, high-speed vessel traffic, etc.

2.3. **MPAs as core areas for whale conservation in South America**

At least five species of great whales occur regularly along South American coasts under different jurisdictions (Palazzo *et al.* 2003): a) **Southern right whales** (*Eubalaena australis*) migrate from feeding areas in Subantarctic regions and concentrate by the coast of Argentina (Península Valdés), Brazil (Southeastern and Southern Brazil) and also occur in Chile and Peru (Reeves *et al*., 2003);

b) **Humpback whales** (*Megaptera novaengliae*) are seasonally concentrated in the Abrolhos Bank, off Brazil, which constitutes one of the most important breeding ground for the species in the Western South Atlantic. It also occurs in South Chile, near Punta Arenas; c) **Common minke** (*Balaenoptera acutorostrata*) and **Antarctic minke** (*B. bonaerensis*) migrate from Antarctic waters and are common along the South American coast. Breeding concentrations for the common form are observed along the northeastern coast of Brazil and calves can be found as far south as Southern Argentina. Less is known about the reproductive behavior and breeding areas for the Antarctic minke whale but calves are also found throughout eastern South America; d) **Bryde's whales** (*Balaenoptera edeni*) are regularly seen off Southeastern Brazil, seasonally concentrated around the islands from 5 to 25 miles from the coast. The occurrence of Bryde's whales in South America is geographically discontinuous, once they are the most commonly reported mysticete in Venezuela (Romero *et al.* 2001) and also occurs off the coast of Peru (Ramirez, 1989, for *B.brydei*)[4].

Regional efforts for whale conservation have already been under way in South America. In particular, right whales have been the focus of coordinated action fostered by the Brazilian Right Whale Project in coordination with partners in Argentina, Chile and Uruguay and exchanges with South Africa. This species is directly linked to the establishment of MPAs in the region and provides a good example to build upon when thinking of regional whale conservation initiatives.

Currently, Argentina and Brazil have dedicated specific protected areas for whales, while Uruguay announced the intention to do so in the very near future, and Chile recently designated its first MPA for whales in August 2003 (CONAMA, 2003), mainly for the protection of humpback whales.

As surveys increase as a direct result of the continent-wide ban on whaling which was established by individual countries in the 1980's and the regional option for non-lethal research, whales are found to occur regularly in a number of MPAs established for reasons other than cetacean protection, demonstrating the need for updating management plans and practical provisions for including these animals in biodiversity protection initiatives involving MPAs. Besides, MPAs as cores of an integrated network can also have a role as focal points of an information system about whale occurrences, thus assisting NGOs and programs for whale conservation that have been developing research, while their results can be a base to develop and/or update MPA management plans.

2.4. **Benefits for MPAs management**

Building a South American MPA Network for Whale Conservation through a specific program could therefore represent an opportunity for strengthening cooperation for the proper management and conservation of Marine Protected Areas and their natural features, while providing a framework for the production and exchange of vital information to support the management of currently protected areas and the designation of new ones.

Some of the outcomes of this system would be:

- Integration of South American countries with marine conservation as a primary objective, through a transboundary management;
- Strengthening of MPAs role within the community in preserving biodiversity, conserving ecosystems and ecological processes, and sustainable uses;

[4] There are at least two morphologically distinct forms for Bryde's whales, very likely different species. The nomenclature of the two forms is unresolved (Kato, 2003, *apud* Reeves *et al.* 2003)

- Promotion of capacity-building, using MPAs as cores for exchanging experiences on the different countries involved;
- Strengthening of individual capacity of participant managers to tackle the challenges posed by whale conservation in their own MPAs and surroundings.
- Acknowledgment of MPAs as focal points for scientific research and monitoring, making possible the organization of databases related to whale conservation, such as the recovery of depleted populations, development of projects and initiatives to better understand migratory routes and movement patterns, development of non-lethal techniques, monitoring of changes in distribution and associated factors (global warming, vessel traffic, seismic activities, shifts in prey density, etc);
- Integration of existing site-based knowledge on major threats and advances in conservation actions, with consequent definition of policies at regional and global level in the different levels related – scientific, legal, judicial and regulatory;
- Development of sustainable and non-lethal economic use of whales for the benefit of coastal communities in the region, through ecotourism and educational activities such as whale watching.

3. CONCLUSIONS AND RECOMMENDATIONS

3.1. There is still a great deal of antagonism among conservation professionals that work on "ecosystem-centered" or "species-centered" programs and initiatives. In the case of Marine Protected Areas, and in particular in developing countries such as those in South America, the integration of efforts to address species and habitat conservation in the same scheme can provide undeniable benefits, that range from the optimisation of scarce resources to the development of a much wider public awareness about the vital role of MPAs.

3.2. The use of whales as 'flagship species' to promote management networking, cooperative research and monitoring, and public awareness, is a legitimate and important tool available for managers and policymakers that must not be overlooked.

3.3. An effort must be initiated looking forward the development of a framework to establish and support a South American MPAs Network for whale conservation, with the cooperation of appropriate international organisations. Stakeholder identification and engagement on the regional level are essential initial steps, and must involve managers of MPAs which present significant occurrence of large cetaceans and may be assisted by NGOs and scientists with acknowledged expertise on developing, managing and/or conducting research and actions focused in whale conservation.

3.4. The whole process shall have a coordination group, taking advantage of existing regional leaderships in issues related to MPAs and whale conservation.

3.5. Attention should be given by international organisations and/or institutions, whose objectives meet MPAs improvement, to the opportunity of dedicating funds to create a specific program aiming to establish, support and maintain the South American MPAs Network.

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