Technical Report

Governing Marine Protected Areas: getting the balance right

Volume 2

Volume 1 of this report and further information and resouces:-
www.mpag.info

MPA governance workshop participants, Cres-Lošinj, Croatia, October 2009

MPA governance network

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Great Barrier Reef Marine Park
Governance Analysis

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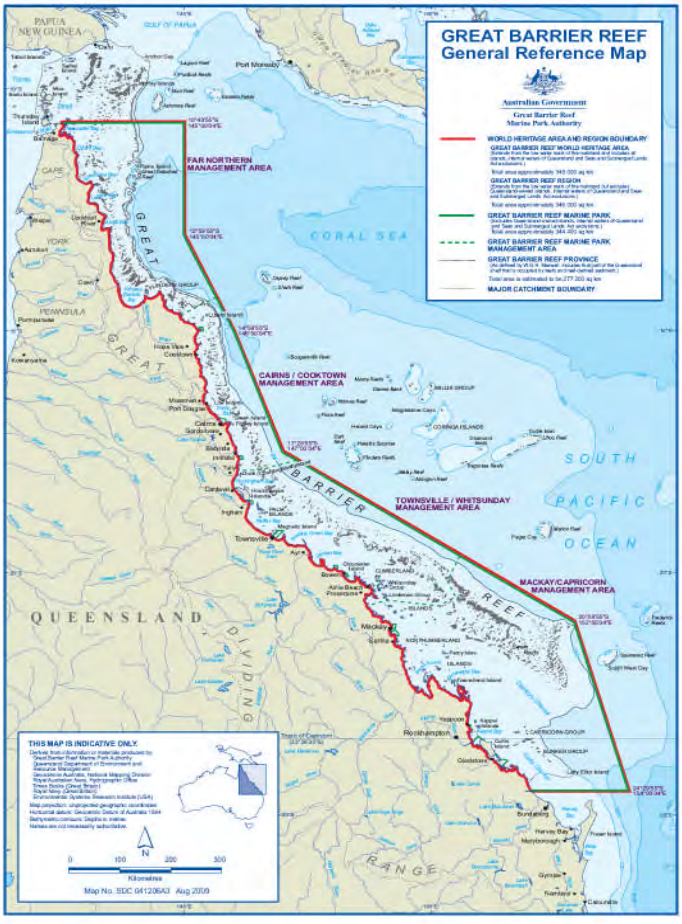
1. CONTEXT

Name of MPA: **Great Barrier Reef Marine Park (GBRMP)** - a single very large MPA
Size of MPA: **344,400 km^2**
Coastline length (where applicable): approx **2,300 km**

Distance from shore: The western boundary of the GBRMP abuts the coastline of the State of Queensland at **low water mark**; it therefore covers some 'coastal waters' (i.e. within 3 nm) but not those regarded as 'internal waters' of Queensland. Most of the GBRMP occurs offshore; at its widest point, the eastern (seaward) boundary of the GBRMP is approx. 280 km offshore (still within the Australian EEZ which extends well beyond the GBRMP into the Coral Sea).

Map showing the outer boundary of GBRMP and GBR World Heritage Area



Population per km^2: - **2.75 people per km^2**
Population growth rate: **1.195%** (2009 est.)
Per capita GDP: **$US36,200** (based on the best available Queensland information for 2005-06); note *the average economic status of people along the GBRMP is slightly lower than the national av. per capita GDP of* ***US$38,000***
GDP growth rate: **3.0%** (2005-06 est.) Coastal Queensland has an enviable, strong economy above the national average GDP growth rate of 2.3% (2008 est.)
GDP composition by sector: (2005-06 est.)

Agriculture, forestry and fishing	3.4
Mining	10.6
Manufacturing	9.8
Electricity, gas and water	2.1
Construction	7.9
Wholesale trade	4.9
Retail trade	7.5
Accommodation, cafes and restaurants	2.9
Transport and storage	6.0
Communication services	2.3
Finance and insurance	5.2
Property and business services	10.0
Government administration and defence	4.7
Education	4.7
Health and community services	6.3
Cultural and recreational services	1.3
Personal and other services	2.3
Ownership of dwellings	8.3
	100.0

Labor force by occupation: - agriculture: 3.6%; industry: 21.1%; services: 75% (2005 est.)
Unemployment rate: **4.2%** (2008 est.)
Government type: - **Federal parliamentary democracy** (i.e. Federal, State and local Governments operating under constitutional arrangements)

2. OBJECTIVES

The *Great Barrier Reef Marine Park Act 1975 (the Act)* is the primary federal legislation for the GBRMP. Following a comprehensive review in 2006, the objects of *the Act* were amended and today are as follows:

(1) *The main object … is to provide for the* ***long term protection and conservation of the environment, biodiversity and heritage values of the Great Barrier Reef Region***.

(2) *The other objects of this Act are to do the following, so far as is consistent with the main object:*

(a) ***allow ecologically sustainable use*** *of the Great Barrier Reef Region for purposes including the following:*

(i) public enjoyment and appreciation;

(ii) public education about and understanding of the Region;

(iii) recreational, economic and cultural activities;

(iv) research in relation to the natural, social, economic and cultural systems and value of the Great Barrier Reef Region;

(b) encourage engagement in the protection and management of the Great Barrier Reef Region by interested persons and groups, including Queensland and local governments, communities, Indigenous persons, business and industry;

(c) assist in meeting Australia's international responsibilities in relation to the environment and protection of world heritage (especially Australia's responsibilities under the World Heritage Convention).

When the initial GBRMP legislation was enacted in 1975, it inferred that zoning plans were to be one of the key management tools. The initial legislation included a specific section requiring the preparation of zoning plans which had to have regard to the following objectives including:

a) the regulation of the use of the Marine Park so as to protect the Great Barrier Reef while allowing the reasonable use of the Great Barrier Reef Region;

b) the regulation of activities that exploit the resources of the Great Barrier Reef Region so as to minimize the effect of those activities on the Great Barrier Reef;

c) the reservation of some areas of the Great Barrier Reef for its appreciation and enjoyment by the public; and

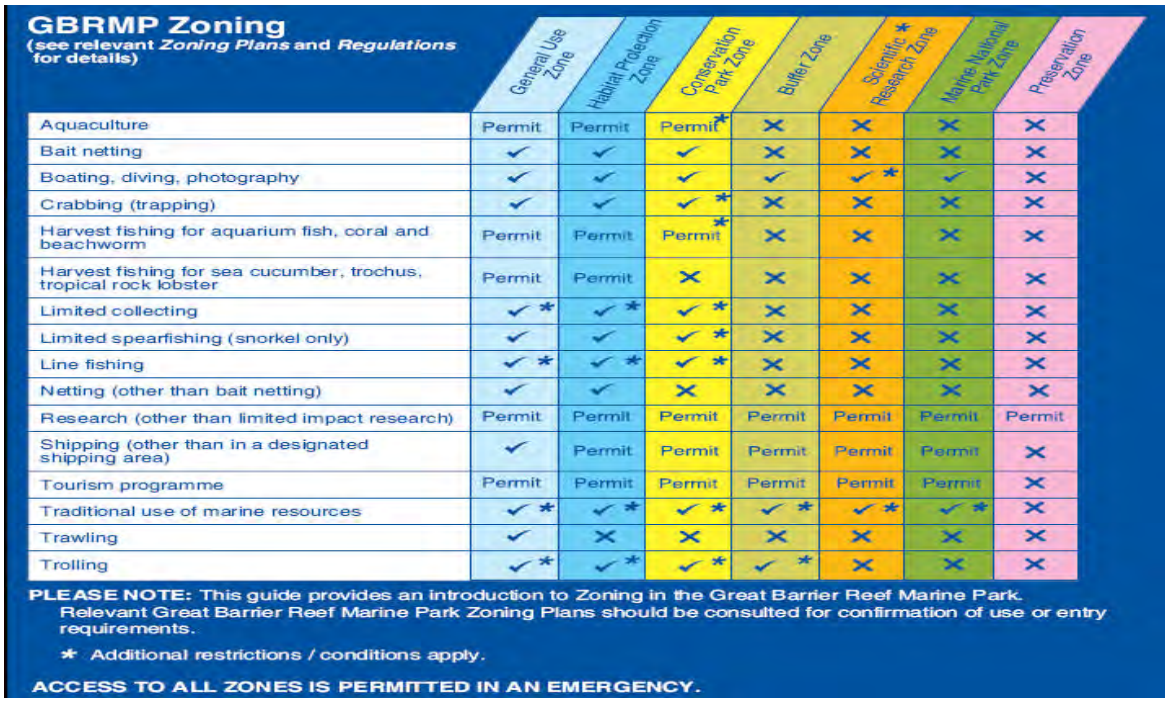
d) the preservation of some areas of the Great Barrier Reef in its natural state undisturbed by man except for the purposes of scientific research.

These legislated objectives were the genesis for the specific zone objectives as used today (refer to **Attachment A**) and have been periodically updated.

Total Area of zone types within the Great Barrier Reef Marine Park

Zone Type	Closest equivalent IUCN category	Area (km^2)	Area (hectares)	% of GBRMP
Preservation	IA	710	71000	<1
Marine National Park	II	114530	11453000	33
Scientific Research	IA	155	15500	<1
Buffer	II	9880	988000	3
Conservation Park	IV	5160	516000	2
Habitat Protection	VI	97250	9725000	28
General Use	VI	116530	11653000	34
Islands (Commonwealth)	*Various* [2]	185	18500	<1
Total		**344400**	**34440000**	**100**

Activities Matrix indicating which activities can occur in which zone, which are prohibited and which activities need a permit



Map showing the current zoning for the GBRMP

3. DRIVERS/CONFLICTS

The experience of the last two decades has shown that much of what will happen to the GBRMP in the future will be determined by factors external to it and to Australia. The factors that currently and are projected to influence the GBRMP's environmental, economic and social values are: **climate change, catchment runoff** and **coastal development** plus the influence of direct use of the Great Barrier Reef (GBR) Region. Many of the threats from both the external factors and those from direct use within the GBR are combining to cause serious impacts on the ecosystem. All these factors are significant to the ecosystem's future functioning and resilience.

Impacts from **climate change** have already been witnessed and all parts of the ecosystem are vulnerable to its increasing effects, with coral reef habitats the most vulnerable. The average annual sea surface temperature on the GBR is likely to continue to rise over the coming century and could be as much as 1 to 3°C warmer than the present average temperature by 2100. In the last decade there have been two severe mass coral bleaching events resulting from prolonged elevated sea temperatures. In addition, GBR waters are predicted to become more acidic with even relatively small increases in ocean acidity decreasing the

capacity of corals to build skeletons and therefore create habitat for reef biodiversity in general. Sea level on the GBR has already risen by approximately 3mm per year since 1991. Changes in the climate also mean that weather events are likely to become more extreme and severe. Almost all GBR species and habitats will be affected by climate change, some seriously.

Coastal development, primarily driven by mining, industry and population growth, is still significantly affecting coastal habitats that support the GBR, connectivity between habitats and the water quality of the GBR. In the past 150 years, the area of the catchment that is intensively farmed has quadrupled. Mining and industrial activity has driven population growth throughout the catchment at rates faster than the Australian average, especially along the coast. The current population of the catchment is about 1,115,000 and it is expected to grow to 1,577,000 by 2026. A growing population leads to an increase in infrastructure and services and, if poorly planned and implemented, these constructions can further modify the coastal environment and cause sedimentation, water quality issues and drainage impacts. Mining and industry is also fuelling growth in ports and shipping with proposals for significant expansion in at least seven of the 10 major trading ports along the GBR coast.

The GBR receives runoff from 38 major catchments which drain 424,000 km^2 of coastal Queensland. Over the last decade, the **declining quality of water** entering the GBR has been recognised as a major threat to the ecosystem. However, despite improvements in local land management, the quality of catchment runoff entering the GBR continues to cause deterioration in the water quality in the GBR Region. Most sediment entering the GBR comes from catchments with large pastoral areas such as the Burdekin and Fitzroy Rivers. The total nitrogen delivered to the GBR is mainly derived from high intensity land use, fertilised cropping and urban areas. Only a small proportion of the load is derived from natural areas. Pesticides from agricultural activities are present in the GBR ecosystem and their impacts are largely unknown. These increased concentrations of suspended sediments and agricultural chemicals are having significant effects in inshore areas of the GBR, close to agricultural areas. Much continues to be done to improve water quality entering the GBR but it will be decades before the full benefits are seen. A decline in inshore habitats will have economic and social implications for coastal communities.

The impacts of different **commercial and noncommercial uses** of the GBR Region overlap and are concentrated inshore and next to developed areas. The GBR supports significant commercial industries, especially commercial marine tourism and fishing, providing employment equal to over 54,000 full-time positions. In 2006/07, GBR industries directly and indirectly contributed an estimated AUD$5.4 billion to the Australian economy.

- **Commercial marine tourism** extends throughout the GBR but its impacts are concentrated in a few intensively managed areas. Tourism (including activities in both the GBR and its catchment) contributed AUD$5.1 billion in 2006/07 ie. a significant contribution to the presentation, management and economic value of the GBR.
- **Fishing** provides opportunities for recreation, resources for the seafood industry, and generates regional economic value with commercial fishing contributing AUD$139 million and recreational use (including fishing) contributing AUD$153 million. There is limited information about many targeted species and of the survival success of discarded species resulting in a poor understanding of the ecosystem effects of fishing.
- Adjacent **ports and shipping** through the GBR service central and northern Queensland industries and communities. Shipping through the GBR is a vital link in the production chain for many industries and services regional centres but most routine shipping activities have negligible consequences. Dredging and construction of port facilities can have significant but localised impacts.
- The impacts of **recreation** (not including fishing) are mainly localised in inshore areas.
- **Defence activities** in the GBR directly contribute to the training and operations of Australia's defence services; the majority of these activities have negligible impacts.
- **Scientific research** improves understanding of the GBR and allows management to be based upon the best available information. Its impacts are concentrated primarily around research stations.
- Importantly, use of the GBR Region goes well beyond commercial activities. **Traditional use of marine resources** provides environmental, social, economic and cultural benefits to Traditional Owners and their sea country. It involves a range of marine species (some of conservation concern)

but levels of take are unknown. Poaching by non-Traditional Owners is a concern for Traditional Owners and management agencies

The current state and trends of most uses are known, with fluctuations largely determined by global factors such as fuel prices, human health issues and economic development. There are some concerns about localised impacts and effects on some species with potential flow on effects to some ecological processes. The future cumulative effects of all use and the ecosystem-level impacts are poorly understood.

4. GOVERNANCE FRAMEWORK/APPROACH

A comprehensive suite of ecosystem-based management arrangements ensure positive environmental outcomes for the GBRMP. Guided by the principle of balancing conservation and sustainable use, the Authority has developed a multiple-use management regime that allows for reasonable use while ensuring the health of the GBRMP and the World Heritage Area for future generations.

The multiple-use zoning network provides high levels of protection (in 'no-take' zones, and small 'no-go' zones) for one third (33.33% or 115,550km^2) of the GBRMP. These zones were chosen in a way which maximised the protection of biodiversity while minimising the impacts on all other users, including fishers. A further 33% is zoned such that the benthic habitat is fully protected including a prohibition on bottom-trawling. The zoning network governs all human activities, providing high levels of protection for specific areas, while allowing a variety of other uses including shipping, dredging, aquaculture, tourism, boating, diving, commercial fishing and recreational fishing, to continue in other zones.

In addition, the Authority uses a range of other management ‘tools’, including permits, public education, enforcement and more recently Plans of Management, site planning, Special Management Areas and some temporal closures, to regulate access and to control and mitigate impacts associated with human use of the Marine Park. Various other management initiatives, including the Reef Water Quality Protection Plan, a Climate Change Action Plan and comprehensive monitoring programs, all help to maintain the health of the Great Barrier Reef as a critical global resource.

5. EFFECTIVENESS

Managing the complexities of the GBRMP requires balancing reasonable human use with the maintenance of the area's natural and cultural integrity. The enormity of the task is due, in part, to the sheer size and diversity of the GBRMP, its economic importance, the political interests (local, state, national and international) and the jurisdictional complexities determined by Australia's system of federalism. Moreover, the close proximity of rural and urban populations to the coast, the range of users and interest groups whose use patterns frequently compete with each other, the need for equity and fairness in facilitating use and access to the Marine Park, and the ecological diversity of the region are all factors that the management and policy framework need to consider.

Despite these complexities, the integrated governance and management model that has been functioning with various amendments over the last 30+ years, has proven to be effective and successful. Indeed, it is widely regarded as such in marine and coastal management circles around the world. GBRMPA's experience and the lessons learned over 33 years of MPA management have helped a number of other marine planning and management processes both within Australia and internationally.

The most comprehensive assessment of the effectiveness of the overall management approach in the GBR was recently undertaken as part of the 2009 Outlook Report. Chapter 6. Existing Protection and Management is an assessment of the existing measures to protect and manage the ecosystem within the GBR Region, examining all activities that contribute to protection and management, both inside and outside the GBR Region (i.e. broader than just the GBRMP). The chapter was based on an independent assessment undertaken by two international experts, Marc Hockings and Brian Gilligan (see report 'Assessment of Management Effectiveness for the 2009 Outlook Report').

6. INCENTIVES

Economic incentives

- Promoting economically and ecologically sustainable resource exploitation

  The GBR has always been a multiple-use area allowing a range of sustainable fishing activities. The 2003 rezoning was done primarily to protect the range of biodiversity in the GBR, but evidence is already showing benefits in adjacent fishing grounds e.g. research (*Current Biology*, Vol 18, 2008) show that coral trout numbers have rebounded by 31 to 75 per cent on a majority of reefs that were closed to fishing after as little as 1.5 to 2 years. The increased fish populations in the no-take zones means huge benefits for the tourism industry on the GBR as well as enhancing the sustainability of reef fishing in the longer term.

- Promoting the 'green marketing' of products and services from the MPA

  GBRMPA encourages high standard marine tourism operations through an eco-certification process; these high standard operators are ecologically sustainable and are helping to protect and present the GBRMP to a consistently high standard.

- Fair sharing of economic costs and benefits

  The assessment by Access Economics demonstrates the level of economic benefits that flow to the GBR catchment area and the Queensland economy as well as to the overall national economy (refer also to $$ figures on p.5)

- Providing economic compensation for restricted users for profits foregone

  A structural adjustment package was initiated for fishers, their employees and other businesses/workers who were significantly negatively impacted by the rezoning of the GBRMP. This package is still being finalised with some components completed (e.g. Licence Buyout Component of the GBRMP Structural Adjustment Package) but the level of economic adjustment has been significant (over AUD$200 million).

- Allocation or reinforcement of community/user property rights

  GBRMPA is working in partnership with Traditional Owner groups along the GBR to assist with the development and implementation of Traditional Use of Marine Resources Agreements (TUMRAs). TUMRAs are formal agreements developed by Traditional Owner groups and accredited by GBRMPA and Queensland, and describe how Traditional Owner groups work with government to manage traditional use activities in sea country

- Funding from private or NGO sources

  One example is the Great Barrier Reef Foundation; this is an independent investor in science that aims to maximize the sustainability of the GBR. Working in partnership with business, science, government and philanthropy, the Foundation funds research that addresses threats and finds solutions to protect and preserve the GBR.

Interpretative incentives

- Public communication, education and awareness raising

  There are many examples of regularly using communication and education to raise awareness about the GBR (e.g. GBRMPA media; Foundation; RRRC). The Outlook Report process and the various products (on-line evidence, fact sheets etc) are also proving very effective in raising awareness in other government agencies as well as with politicians and the public

- Role of celebrity 'champions'

  'Champions' (well recognised celebrities) were used very effectively during the rezoning to raise public awareness.

- Promoting recognition of the potential resource benefits from well-managed MPAs

  See comments above re increased fish numbers in no-take zones. Another example is the research results from Australian Institute of Marine Science (*Current Biology*, Vol 18) showing that a marked reduction in outbreaks of crown-of -thorns starfish (COTS) in the no-take areas closed to fishing. This has implications for the entire GBR, not just the highly protected zones. The relative frequency of outbreaks on reefs that were open to fishing was 3.75 times higher

than that on no-take reefs in the mid-shelf region of the Reef, where most of the outbreaks have occurred.

Knowledge incentives

- Integration of local/traditional/indigenous knowledge in MPA decision-making

  The development and implementation of Traditional Use of Marine Resources Agreements (TUMRAs with Traditional Owner groups which are then accredited by GBRMPA and Queensland), is an example of a co-management approach to work with government in the management of traditional use activities in sea country.

  Recognising traditional names is another way of showing respect for local traditions relating to places or areas, customs or practices; in the GBRMP there are over twenty distinct languages. Once such place names are confirmed with the Traditional Owners for the area, they are shown on the official maps with the traditional name first, and if there is an established European name, that follows (but in brackets).

  The Indigenous Reef Advisory Committee provides valuable advice to the GBRMPA on activities the Indigenous Land and Sea Country Partnership Program should support.

- Maximizing scientific knowledge to guide/inform MPA decision-making.

  An independent Scientific Steering Committee with expertise in GBR ecosystems and biophysical processes was convened to define biophysical operational principles to guide the development of a new representative network of no-take areas in the GBRMP (Fernandes et al, 2005). Another committee guided development of socio-economic- cultural and management principles.

  Science (both biophysical and social science) assisted by providing the best available information as a fundamental underpinning for the RAP. It is important to note, however, that the final outcome was not a science-based outcome. Rather, it was a socio-political outcome that was informed by the best available science but also other social, economic and pragmatic considerations.

  The analytical approaches during RAP included marine reserve design software specifically adapted for the GBR, and a suite of GIS-based spatial analysis tools. The analytical software enabled the GBRMPA to integrate a number of data layers representing biophysical, social and economic values, and enabled a number of options to be generated and assessed.

  The Outlook Report process was quite specific about what scientific evidence existed (on-line evidence, etc) and the various knowledge gaps.

- Promoting mutual respect and collective learning between different knowledge owners

  Traditional Owner groups, government and the broader community are working together to improve populations of culturally significant animals such as green sea turtle and dugong. Story Place is one example of a useful resource for Aboriginal and Torres Strait Islanders, GBR managers, researchers, students, stakeholders and other people interested in learning more about Traditional Owner connections with the GBR; the database holds hundreds of references relating to Indigenous history and co-operative management practices..

- Developing mechanism for independent advice in the face of conflicting information and/or uncertainty

  The application of the precautionary principle, and the decision to 'adaptively manage' in the absence of perfect knowledge, are both important factors in the successful management approach in the GBRMP. The precautionary principle is in the legislation and an adaptive management approach involving periodic monitoring against indicators is normal practice.

- Employing approaches that support collective learning, e.g. participative GIS, participative workshops, etc

  A combination of expert opinion, stakeholder involvement and analytical approaches were used to identify options for possible zoning networks. Science (both biophysical and social science) assisted the RAP by providing the best available information as a fundamental underpinning for the overall process. Independent experts greatly assisted in the development of a number of 'products' that were fundamental in the planning process. e.g. scientists assisted GBRMPA to map the biodiversity of the GBR into 70 bioregions.

Legal incentives

- International-regional-national-local regulatory obligations

  A number of international conventions are relevant to the GBR; one of the more important conventions relates to World Heritage. The GBRMP comprises approx. 99.3% of the GBR World Heritage Area; the boundary of the GBR World Heritage Area is shown at Map 2; the GBR World Heritage Area extends to the low water mark on the mainland coast, but also includes all the islands and all waters within the outer boundaries of the GBRMP.

- Clarity and consistency in defining legal objectives, jurisdictional boundaries, roles and responsibilities of different authorities and organizations.

  Ever since the GBRMP was declared in 1975, the landward boundary has been low water; however to complicate matters, the definition applied by the Commonwealth (mean low water) differs from that used by Queensland (lowest astronomical tide). These complexities were largely alleviated when Queensland determined, in November 2004, to 'mirror' the new zoning for the GBRMP in most of the adjoining State waters, so now there is complementary zoning (ie. consistent objectives and zone provisions) from HWM to the outer limits of the GBRMP (i.e. virtually all the State and Commonwealth waters throughout the entire GBR World Heritage Area) making it easier for users and managers alike.

- Legal or other official basis for cross-sectoral/cross-jurisdictional restrictions to support the achievement of MPA objectives

  See comments in dotpoint above; this means there is excellent cooperation across a range of Queensland and Federal agencies for surveillance and enforcement purpose.

  The GBR legislation also has provisions to take a broad ecosystem-approach, allowing regulatory controls on activities well outside the jurisdictional area (e.g. the GBRMPA was able to bring in Regulations controlling aquaculture up to 5 km landward of the GBRMP when concerns were raised about the potential adverse impact of discharges associated with aquaculture activities). The integrated management approach also extends well outside the marine areas to include all the islands, all the tidal lands/tidal waters and many activities in the catchments; furthermore most of the management approaches today (e.g. addressing water quality issues) are done in partnerships with local government and industries throughout the catchment.

- Effective judicial system for penalizing transgressors

  There is an effective judicial system for penalizing transgressors and the legislation has very high maximum penalties if the courts choose to use them (e.g. up to a maximum of 50,000 penalty units = AUD$5.5 million for an aggravated contravention by a body corporate). Enforcement action and prosecution are two important tools that managers have available to them. Because of the dedication to user education in the GBR, these approaches are not necessarily the tools of first opportunity, nor are they always the tools of last resort. GBRMP inspectors have the discretionary power to decide a course of action on a case-by-case basis with options including enforcement action, infringement notices and prosecution.

- Legal provisions to ensure public rights and transparency in MPA management processes

  The management philosophy in the GBRMP is one of balancing conservation with reasonable use as is indicated by the hierarchy of objects in the legislation (s. 2A of the Act as shown on p. 2). GBRMPA's decision making processes have various conflict resolution processes built in (e.g. Review rights for permit decisions). The Administrative Appeals Tribunal and the Ombudsman provide two further avenues for adjudication if necessary.

- Performance standards/conditions/criteria/requirements related to the MPA's conservation objectives and attached to property rights, participatory governance structures, etc

  For each zone type, the GBR Zoning Plan sets out in detail two specific lists of 'use or entry' provisions; these clarify overtly what activities may be allowed to occur or are prohibited in that particular zone:

1. The first list indicates activities that are allowed to occur in that zone *('as of right'*) and which do not require a permit; and
2. The second list stipulates which activities may occur in that particular zone but only after a permit has been assessed and, if the application meets all the necessary requirements, a permit has been granted. The Regulations specify the assessment process and the criteria for a permit.

If an activity is not listed in either (1) or (2) above, then it is effectively prohibited.

- Provision of financial and institutional resources for MPA governance, particularly law enforcement

  Considerable funding is provided from a range of funding sources and the total budget for 2007-08 was AUD $46.3 million (GBRMPA Annual Report). This was AUD$ 6million more than the 2006-07 appropriation and was primarily due to new measures to provide for enhanced field management for the GBRMP and the Climate Change Adaptation Program.

  Additional information about the GBRMPA budget and how it is expended can be seen in Chapter 4 of the 2006 Review Report (pp. 36, 38-41 provide specific details)

  Considerable resources and technological advances (e.g. satellite transponders on trawlers = VMS) are used in surveillance and enforcement; without adequate compliance the management of the GBRMP would not be successful. GBRMPA has always, and will continue, to view education as the most effective strategy to encourage compliance with GBRMP management principles.

Participative incentives

- Participative governance structures and processes such as stakeholder committees, stakeholder consultations, participative GIS planning, etc

  GBRMPA currently has four expertise-based Reef Advisory Committees (one each addressing water quality, conservation, fisheries and tourism issues) and eleven Local Marine Advisory Committees; these all provide advice and make recommendations to GBRMPA.

During the rezoning GBRMPA recognised the need to conduct an effective consultation program; this became the most comprehensive process of community involvement and participatory planning for any environmental issue in Australia's history. Every major settlement along the Great Barrier Reef coast was visited involving hundreds of stakeholder and public meetings.

During the two formal phases of consultation, over 31,000 public submissions were received, clearly showing the vast level of community interest. More information is available on the RAP website.

- Addressing social/environmental justice issues; building trust/social capital between different actors

  Following the huge level of public interaction during the RAP/rezoning, there was a conscious decision to put additional resources into improved community engagement. The establishment of regional offices in communities along the GBR Coast has been about enhancing the work that GBRMPA is already doing by developing better linkages with, and greater understanding of, coastal communities and enhancing local involvement in decision-making, compliance and stewardship of the Great Barrier Reef.

  The GBRMPA now has dedicated liaison staff comprising a small team based in Cairns, Townsville, Mackay and Rockhampton; these officers are expected to travel throughout their regions regularly with the following primary roles

  - To enhance communication between regional stakeholders and the main GBRMPA office in Townsville
  - To strengthen relationships with our management partners (espec Queensland Parks and Wildlife Service) and other government agencies in the regions
  - To provide support to the existing Local Marine Advisory Committees and other regional GBRMPA initiatives and activities based in the regions.

  While there was considerable angst generated during the rezoning, most of that has now dissipated and there would be major public outcry if large parts of the no-take areas were opened for

extraction. During the 2006 public review of the GBRMP legislation, there was a strong call from a wide range of stakeholders to maintain an independent statutory authority and reinforce the role of the agency rather than incorporate GBRMPA into the Department.

- Transparent participation and decision-making processes

  The significant changes between the initial zoning, the Draft Zoning Plan and the final Zoning Plan, as accepted by Parliament, are readily seen in the 'Review of the Great Barrier Reef Marine Park Act'- Review Panel Report, released in 2006. These changes are largely the result of additional information received either in public submissions or in another ways. Maps 9, 10 and 11 on pages 69-71 of that report highlight the differences between the draft and final Zoning Plans. Many of the aspects outlined in this chapter in the Review Report are illustrated in the Capricorn-Bunker case study shown in more detail in the same report (i.e. pp. 78-90 of the same webpage).

- Clear rules on the means and degree of participation from different groups

  Having clear and transparent policies and guidelines helps everyone to see the position of the agency (e.g. policies); similarly the zoning maps which are provided free of charge throughout the GBR catchment show all users the relevant zones and zoning provisions.

CROSS CUTTING ISSUES/FACTORS:

1. Leadership

- Strong leadership for the MPA, e.g. from particular people within the community of from local/national/international NGO, agency and political levels

  Effective leadership (at both the political and agency levels) was one of the key factors in the success of the GBR rezoning.

- Long-term vision, consistency and stability of the leadership

  While the GBR is recognised as one of the world's best managed reefs and is likely to survive better under the pressure of accumulating risks than most reef ecosystems, the Outlook Report identifies that the current long-term outlook for the Great Barrier Reef is poor. Unavoidably future predictions of climate change dominate most aspects of the GBR's outlook over the next few decades. Decisions made in the next several years are likely to determine its long-term future and will depend to a large degree, on the extent to which climate change is addressed worldwide and on the resilience of the ecosystem in the immediate future.

- Role of the leadership in facilitating the use of above incentives and bringing good MPA governance

  The success of the GBR rezoning, which has been internationally recognised a 'best-practice', could not have happened without effective leadership (at both the political and agency levels) and their influence on many of the above incentives.

2. Role of NGOs

- What role(s) do NGOs play in the use of above incentives?

  NGOs played an important role during the GBR rezoning especially by providing a counter-balancing perspective to those who were pro-exploitation.

- What are the role(s) of NGO(s) with government agencies and other parties in MPA decision-making and governance

  NGOs do not have any greater role in decision-making and governance than any other stakeholder group; like other stakeholders, NGOs are represented on key advisory committees.

3. Equity

- How significant an issue is equity in your case study?

  At the completion of the rezoning, no-one group felt they got everything they wanted; however all groups agreed they had numerous opportunities to participate and that the final outcome showed significant changes between the draft and final Zoning Plan based on the public submissions and the additional information provided while still maintaining the key operating principles to

adequately protect biodiversity.

4. Stewardship

- How significant an issue is stewardship or sense of ownership in your case study MPA?

A relatively new way of doing business in the GBRMP is the development of strategic partnerships with industry (e.g. tourism and the commercial fishing industries) to ensure the GBR is sustainable in the face of threats like climate change.

One of the best examples of stewardship in the GBR is a Stewardship Action Plan (SAP) developed by Pro-vision Reef, believed to be a world's first for a fishery. Developed by the aquarium supply fisheries in collaboration with Federal and State management agencies, and coral reef scientists, the SAP establishes a uniform specimen collection standard across the industry. A key component of the SAP involves responding to the challenge of global climate change.

A partnership between the GBRMPA and Queensland Seafood Industry Association (QSIA) was recently officially launched and is already showing mutual benefits e.g. economically beneficial for industry and good for the environment. The partnership was formed to meet some key objectives under the GBR Climate Change Action Plan and aims to help the fishing industry "future-proof" itself to be able to adapt to, and mitigate against, the impacts of future change (including climate change). The project is summarized in the QSIA/GBRMPA Climate Change and Fisheries Partnership Project Bulletin.

Recent activities with tourism have built upon on existing well-established partnerships that have shown to have mutual benefits.

7. Key issues

The ongoing management of the GBR is effective for a range of reasons, including:

- a sound governance/legislative framework, including complementary State/Federal legislation
- ecosystem-level management (EBM)… including management influence over a wider context than just the Federal Marine Park
- well developed/integrated management with all relevant Federal & State agencies, including formal and informal arrangements with Queensland as the adjacent jurisdiction
- consequent socio-political support
- widespread consensus that the GBR is important, with many industries depending upon its health, recognising it is worth conserving
- effective research & monitoring programs, prioritised to provide information for management.

The approach taken in the RAP is now recognised as one of the most comprehensive and innovative global advances in the systematic protection and recovery of marine biodiversity and marine conservation in recent decades. Widespread national and international recognition of the planning process has led to 12 awards (national, international, and local, including the UNESCO/MAB Environmental Prize), and acknowledgement of the process and outcome as 'best practice' influencing many other global marine conservation efforts.

The RAP/rezoning was a good example of a combination of incentives ie. we achieved very good marine biodiversity outcomes by using the best available **knowledge**, augmenting it with public **participation (**which required a huge effort but was clearly worth it), to produce a **legislative** framework that was subsequently adopted in the adjacent Queensland waters and the overall management approach has since been demonstrated to have considerable direct and indirect **economic** benefits

A range of strategies continue to be implemented to ensure the GBR is protected now and into the future. These strategies have been developed in conjunction with Queensland, local governments and industry, and are designed to maintain the health and increase the resilience of the GBR to cope with

escalating pressures; they include:

- Maintaining compliance with the Zoning Plan and supporting Regulations
- Improving water quality through the Reef Water Quality Protection Plan.
- Promoting sustainable fisheries
- Developing sound policy regarding the effects of climate change on the GBR
- Promoting sustainable tourism

Attachment A - Overview of provisions of the Great Barrier Reef Marine Park Zoning Plan 2003

(Note: this list is not exhaustive; please refer to the actual Zoning Plan for details of provisions)

Zone	Zone Objectives	Examples of 'as of right' activities	Examples of activities requiring permission of the Authority
General Use Zone (light blue) Most compatible IUCN category -**VI**	The objective of the General Use Zone is: (a) to provide for the conservation of areas of the Marine Park, while providing opportunities for reasonable use.	Low impact activities such as recreational activities not involving taking of animals/plants, Photography, film & sound recording, Limited impact research, Limited education programs, Navigation of vessels, Fishing involving: trawling, line fishing, trolling, netting (including bait netting), limited spear fishing, crabbing, limited collecting, harvest fishing (tropical rock lobster, sea cucumber, coral, aquarium fish), Traditional use of marine resources under an accredited agreement.	Aquaculture operations, Fishing involving: harvest fishing (that is not conducted within an accredited management plan), conduct of a developmental fisheries program, operating a fishing industry service vessel, Tourism programs, Vessel charter operations, Construction and operation of facilities or carrying out of works; Research or Educational programs other than limited education/limited impact research, Traditional use of marine resources (other than activities conducted under an accredited agreement). Any other purpose consistent with the objectives of the zone

Habitat Protection Zone (dark blue) Most compatible IUCN category –**VI**	The objectives of the Habitat Protection Zone are: a) to provide for the conservation of areas of the Marine Park through the protection and management of sensitive habitats, generally free from potentially damaging activities; and b) subject to (a), to provide opportunities for reasonable use.	As above EXCEPT trawling and navigation of ships (other than in a designated shipping area).	As above, AND the navigation of ships outside of designated shipping areas.
Conservation Park Zone (yellow) Most compatible IUCN category - **IV**	The objectives of the Conservation Park Zone are: (a) to provide for the conservation of areas of the Marine Park; (b) subject to (a), to provide opportunities for reasonable use and enjoyment, including limited extractive use	• Low impact activities such as recreational activities not involving taking of animals/plants, • Photography, film & sound recording, • Limited impact research, Limited education, • Navigation of vessels (other than ships), • Fishing involving: limited line fishing, trolling, bait netting, limited spear fishing, limited crabbing, limited collecting, harvest fishing (coral, aquarium fish), • Traditional use of marine resources under an accredited agreement.	As above.

Buffer Zone **(olive green)** Most compatible IUCN category - **IV**	The objectives of Buffer Zone are: (a) to provide for the protection of the natural integrity and values of areas of the Marine Park, generally free from extractive activities; (b) subject to (a), to provide opportunities for: (i) certain activities, including the presentation of the values of the Marine Park, to be undertaken in relatively undisturbed areas; and (ii) trolling for **pelagic** species	As above EXCEPT fishing is limited to trolling for pelagic species, and limited impact research is limited to non-extractive research.	As above.
Scientific Research Zone **(orange)** Most compatible IUCN category - **IA**	The objectives of the Scientific Research Zone are: a) to provide for the protection of the natural integrity and values of areas of the Marine Park, generally free from extractive activities; and b) (b) subject to (a), to provide opportunities for scientific research to be undertaken in relatively undisturbed areas.	As above EXCEPT both limited impact research (extractive) and limited impact research (non-extractive) are allowed. Fishing is not allowed in the zone.	As above.

National Park Zone (green) Most compatible IUCN category - **II**	The objectives of the Marine National Park Zone are: (a) to provide for the protection of the natural integrity and values of areas of the Marine Park, generally free from extractive activities; and (b) subject to (a), to provide opportunities for certain activities, including the presentation of the values of the Marine Park, to be undertaken in relatively undisturbed areas.	• Low impact activities such as recreational activities not involving taking of animals/plants, • Photography, film & sound recording, • Limited impact research (non-extractive), Limited education programs, • Navigation of vessels (other than ships), • Traditional use of marine resources under an accredited agreement.	As above. Research, including limited impact (extractive) research that is relevant to the management of the Maine Park, or that cannot reasonably be conducted elsewhere.
Preservation Zone (pink) Most compatible IUCN category - **IA**	The objective of the Preservation Zone is: (a) to provide for the preservation of the natural integrity and values of areas of the Marine Park, generally undisturbed by human activities.	Navigation of vessels (other than ships) for access to the coast of Queensland, Operation of an aircraft >500 feet above the surface, See also "Additional purposes for ruse and entry"	Research that is relevant to the management of the Maine Park and that cannot reasonably be conducted elsewhere.

Commonwealth Islands Zone (takes the colour of the adjoining zone)	The objectives of this Zoning Plan for the Commonwealth Islands Zone are: (a) to provide for the conservation of the natural integrity and values areas of the Marine Park above low water mark; and (b) to provide for use of the zone by the Commonwealth; and (c) subject to (a), to provide for facilities and uses consistent with the values of the area	Low impact activities such as recreational activities not involving taking of animals/plants, Photography, film & sound recording, Limited education, Traditional use of marine resources under an accredited agreement, Navigation of aircraft.	Tourism programs, camping, Aircraft and vessel charter operations, Construction and operation of facilities or carrying out of works; Research, educational programs Traditional use of marine resources (other than activities conducted under an accredited agreement). Any other purpose consistent with the objectives of the zone.

Darwin Mounds
Governance Analysis

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1. CONTEXT

Name of MPA: Darwin Mounds candidate Special Area of Conservation, United Kingdom (presently a closed area under the EC Common Fisheries Policy)

Size of MPA: 1380 km2
Distance from shore: 185 km NW of Scotland

Population per km^2: 61,113,205/243,610 km^2 (July 2009 est.) = approx. 251/km^2
Population growth rate: 0.279% (2009 est.)
Per capita GDP (PPP US$): $36,600 (2008 est.)
GDP growth rate: 0.7% (2008 est.)
GDP Composition by Sector:
agriculture: 0.9%
industry: 22.8%
services: 76.2% (2008 est.)
Labour force by occupation:
agriculture: 1.4%
industry: 18.2%
services: 80.4% (2006 est.)
Unemployment rate: 6.4% (2009 est.) and likely to grow due to global economic slowdown
Government Type: constitutional monarchy and Commonwealth realm

2. OBJECTIVES

The Darwin Mounds lie approximately 185 km to the northwest of Scotland (within the UK EEZ) at a depth of around 1000 m, scattered across approximately 1500 km^2 and supporting significant amounts of *Lophelia pertusa* (Linnaeus, 1758) and associated biodiversity, including sessile or hemi-sessile invertebrates and giant protozoan xenophyophores (*Syringammina fragilissima*, Brady, 1883) (Bett, 2001). The hundreds of mounds present in the area are approximately 100 m in diameter and 5 m in height. The MPA contains 1380 km^2 of the area. Figures 1 and 2 show the location and extent of the Darwin Mounds, and Figures 3 and 4 show the proposed and final closure areas[1]

The formal conservation objective for the Darwin Mounds is to protect a deep, cold-water coral reef from bottom-trawling (reef habitats are protected under Annex I of the Habitats Directive[2]). The area is closed to bottom-trawling but not pelagic fishing. The Darwin Mounds were initially closed under a six-month emergency closure through the CFP: Regulation 1475/2003[3] of 27 August 2003. This closure was extended

[1] Figures reproduced from De Santo, EM and Jones, PJS (2007)
[2] Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, OJ L206, 22.07.92. p. 7.
[3] Commission Regulation (EC) No. 1475/2003 on the protection of deep-water coral reefs from the effects of trawling in an area north west of Scotland. OJ L 211, 21.8.2003, p.14.

for a further six months under Regulation 263/2004[4] of 14 February 2004. The permanent closure of the area involved amending Regulation 850/98[5] of 30 March 1998 on the conservation of fishery resources through technical measures for the protection of juveniles of marine organisms. The permanent ban on bottom-trawling in the Darwin Mounds area came into effect as Regulation 602/2004[6] on 22 March 2004, adding the geographical location of the Darwin Mounds area to Article 30 of Regulation 850/98 in its section on restrictions on the uses of demersal towed gears. The remainder of this section provides some background information on the designation; for more details see De Santo and Jones 2007a and 2007b.

Background information

The Darwin Mounds area of *Lophelia* was first discovered in May 1998 during a seabed survey conducted by Southampton Oceanography Centre (SOC) scientists on behalf of the Atlantic Frontier Environment Network (AFEN), a partnership between the oil and gas industry and UK government agencies including the Department of Trade and Industry (DTI[7]), the Joint Nature Conservation Committee (JNCC) and the Scottish Office Agriculture and Fisheries Department (AFEN, 2000; Bett, 2001). The 1998 AFEN-sponsored survey that initially discovered the Darwin Mounds was followed in 1999 by a DTI-sponsored survey, again conducted by SOC scientists, during which the eastern field of mounds was discovered. The Darwin Mounds were further investigated twice during the summer of 2000, when evidence of damage from bottom-trawling was visible over half of the eastern fields (Bett, 2001; Wheeler *et al*., 2005). At the time of their discovery, the Darwin Mounds were a 'unique' example of *Lophelia* growing on sandy mounds (rather than a hard substrate) with a distinctive 'tail' structure not seen elsewhere. This 'uniqueness' played an important role in moving the policy process for protection forward, however more recently, similar *Lophelia*-topped mounds have been found in the Porcupine Seabight to the west of Ireland.

The discovery of the Darwin Mounds coincided with the launch of the Greenpeace Atlantic Frontier climate change campaign aimed at halting further oil exploitation and beginning a phase-out of fossil fuels. Greenpeace first targeted the 17th Round of licensing on the UK Continental Shelf (for the period 1996-1997), charging the UK Government with not taking the Habitats Directive into account when taking decisions about the areas to be licensed. This first effort was unsuccessful as their application was delayed and came too late in the licensing round, and it was overturned in a House of Lords plenary case. Their second attempt, aimed at the 19th Round (for 2000-2001), went in earlier and was successful. This ruling[8] is commonly referred to as the Greenpeace judgment and is discussed in more detail below (Legal basis). However as the process for extending the UK's Habitats Directive implementation legislation over the continental shelf took several years[9], the UK utilized a new emergency closure mechanism under the revised Common Fisheries Policy (CFP) which came into effect in 2002. There was considerable interest on the Commission level to show that the CFP was more environmentally-conscious following its reform process, and the UK was able to compromise with other Member States (notably France and Spain) in discussions on the extent and geographic area of the closure. As illustrated in Figures 3 and 4, the 'box' surrounding the Darwin Mounds was modified in shape to meet French requests for trawling to be allowed near the north-west and north-east corners of the closure, and Spain successfully argued for pelagic fishing to continue to be allowed in the area. The role of non-governmental organizations in this process is worth noting – the aforementioned Greenpeace campaign was followed by a couple of reports by WWF on conserving the Darwin Mounds, as well as a campaign on establishing MPAs in the North East Atlantic.

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[4] Commission Regulation (EC) No. 263/2004 of 15 February 2004 extending for six months the application of Regulation (EC) No. 1475/2003, OJ L 46, 17.2.2004, p.11.

[5] Council Regulation 850/98 of 30 March 1998 for the conservation of fishery resources through technical measures for the protection of juveniles of marine organisms. OJ L 125, 24.7.98, p.1.

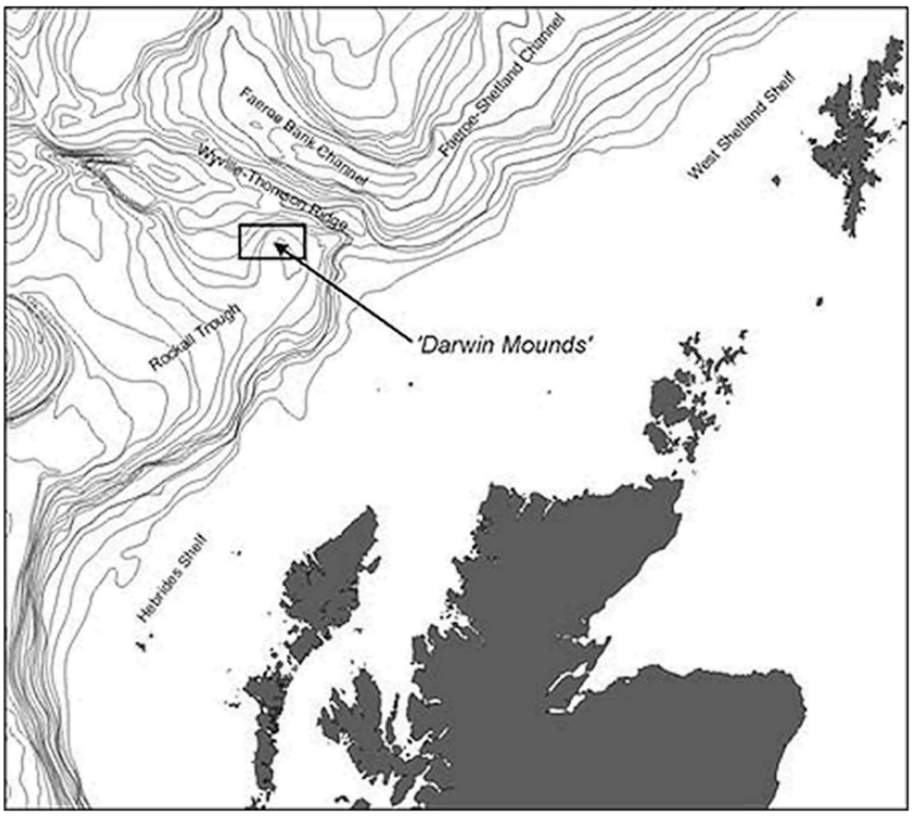
[6] Council Regulation (EC) No. 602/2004 of 22 March 2004 amending Regulation (EC) No. 850/98 as regards the protection of deepwater coral reefs from the effects of trawling in an area north west of Scotland. OJ L 97, 1.4.2004, p.30.

[7] The DTI has since been reorganized and renamed as the Department of Energy and Climate Change (DECC).

[8] R. v. Secretary of State for Trade and Industry, *ex parte* Greenpeace (No. 2) [2000] 2 CMLR 94.

[9] The relevant legislation ((Natural Habitats, &c.) Regulations (GB: 1994 (as amended in 2007); NI: 1995) applying the Habitats Directive throughout the UK EEZ was released in 2006 and the Darwin Mounds have been put forward as a candidate Special Area of Conservation.

Figures 1 and 2: Location and extent of Darwin Mounds area (adapted from Johnston and Tasker, 2002. Figures courtesy of Brian Bett, National Oceanography Centre, Southampton)



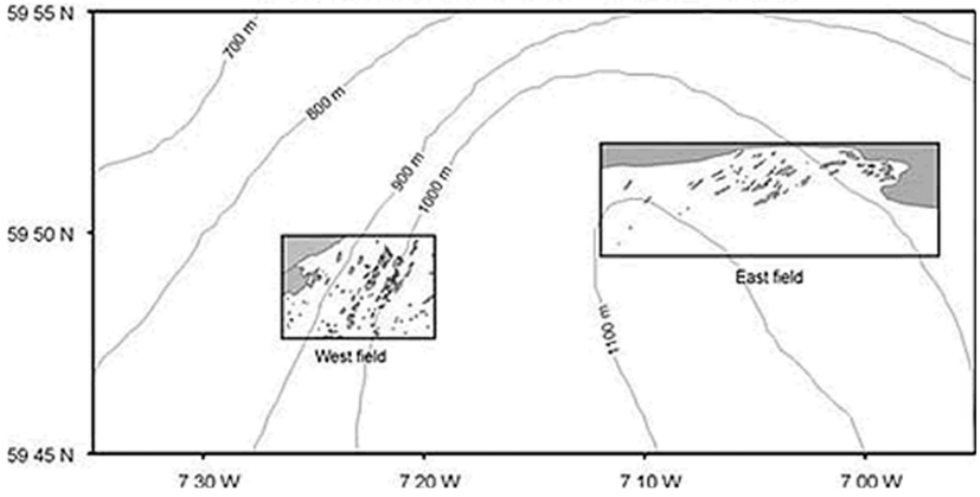


Figure 3: Proposed 'box' closure surrounding the Darwin Mounds area

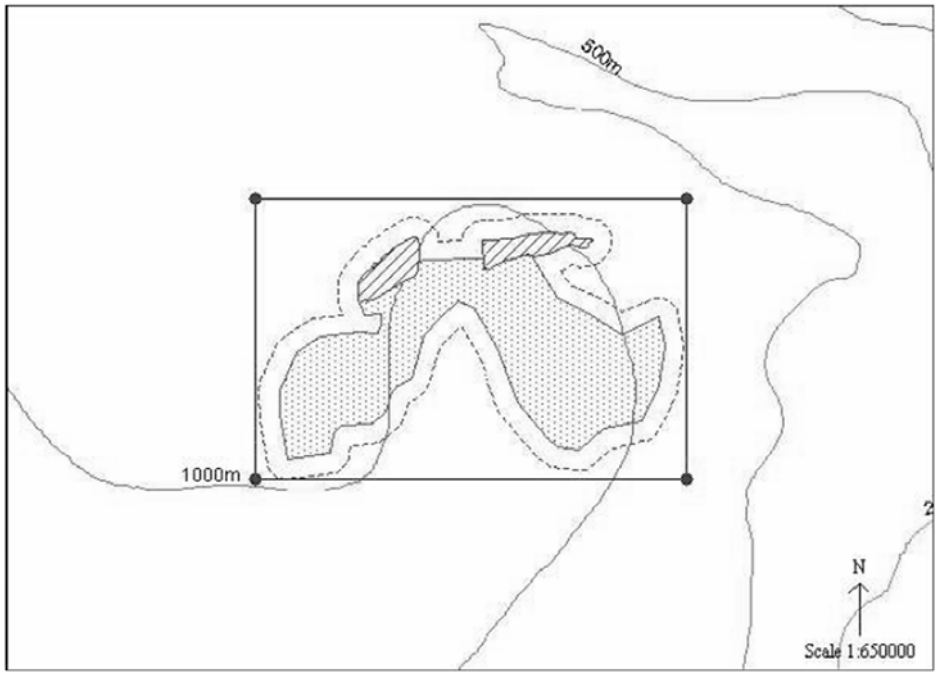


Figure 3. Darwin Mounds closure as recommended by the ICES Advisory Committee on Ecosystems. (Adapted from and reproduced with permission from ICES).
Legend: Extent of mounds region mapped by AFEN, limits of interpreted side-scan of Darwin Mounds East and West fields, possible site boundary generated using simple point coordinates, - - - - - 2.2 km margin from region of mounds, ——— bathymetric contour ©GEBCO Digital Atlas, British Oceanographic Data Centre on behalf of IOC and IHO 1994 and 1997

Figure 4: Permanent Darwin Mounds closure

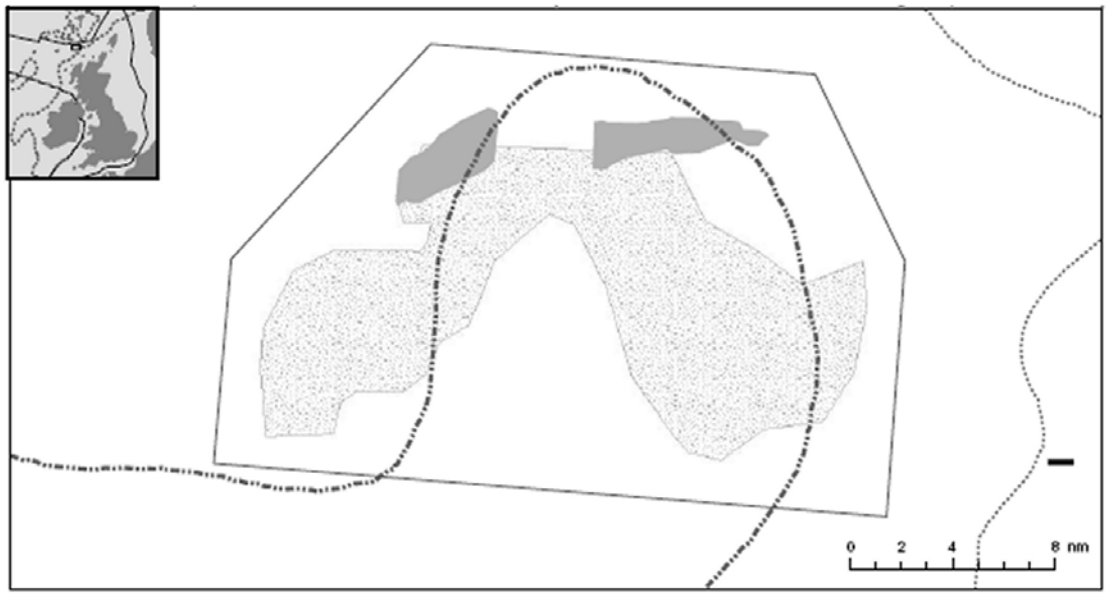


Figure 4. Permanent Darwin Mounds closure. (Adapted from and reproduced with permission from the JNCC).
Legend: East and West fields of dense mounds, extent of mounds, bottom trawling exclusion area, 1000 m isobath. GESCO bathymetry ©NERC 1994, 1997. Darwin Mounds East and West fields and mounds extent courtesy of Dr. Brian Bett, Southampton Oceanography Centre.

3. DRIVERS/CONFLICTS

For the UK offshore environment (i.e. beyond the 12nm territorial sea out to the 200nm boundary of the UK Exclusive Economic Zone (EEZ)), the key industrial activities with a potential to affect this particular MPA are (1) fishing and (2) oil and gas exploration and extraction.

Fishing activities

Focusing on the North-West offshore area of Scotland referred to as the "Atlantic Frontier", where the Darwin Mounds are located, the primary economic activity is offshore fishing. The fishing methods used in this area include bottom trawling, semipelagic trawling, and longlines. Bottom trawling occurs from the shelf-slope break down to approximately 1700 metres, with target species varying according to depth, as follows:

Upper slope: angler fish or monkfish (*Lophinus spp.*)
Mid-slope: blue ling (*Molva dypterygia*) and roundnose grenadier (*Coryphaenoides rupestris*) with bycatches of black scabbardfish (*Aphanopus carbo*) and deep-water sharks.
Lower-slope: orange roughy (*Hoplosthetus atlanticus*)

Semipelagic trawl fisheries in this region target spawning (i.e. seasonal) aggregations of blue whiting (*Micromesistitus poutassou*) and greater silver smelt (or argentine, *Argentina silus*). The upper slope longline fishery is dominated by Spanish and UK vessels targeting hake (*Merluccius merluccius*) and Norwegian vessels targeting ling (*Molva molva*), blue ling and tusk (*Brosme brosme*).

As the above description is circa 2001 (Gordon, 2001), it reflects the situation at the time of the Darwin Mounds' discovery, though it does not include any subsequent population crashes or prohibitions on deep sea fishing since enacted under EC legislation. A recent long-term study of deep sea fisheries in the North East Atlantic (Bailey et al. 2009) shows significant declines in fish populations. Whether or not fishing was a major factor around the Darwin Mounds area is somewhat debatable. Interviews with members of the UK regulatory community and fishing industry conducted as part of my doctoral research indicated that the

amount of fishing actually taking place on the Mounds was relatively small, though there was evidence of bottom-trawling and associated damage to the Mounds (De Santo unpublished PhD dissertation).

Oil and gas exploration activities

While not currently an issue in the area immediately adjacent to the Darwin Mounds, the UK will likely be exploring for oil and gas west of the Shetland islands (i.e. east of the Darwin Mounds) in coming years. This area may contain 17% of the UK's remaining oil reserves and 10-15% of its natural gas, but with high costs of production due to the inhospitable climate. Nevertheless, in 2009 the House of Commons recommended that '*The Government should instigate and fund a comprehensive survey of the marine environment and its wildlife west of Shetland in order to evaluate the full potential effect of intensive oil and gas recovery activities in the area".*[10] Consequently oil and gas development, while not currently an issue for the Darwin Mounds MPA, is worth mentioning as a potential issue for offshore MPAs elsewhere on the UK continental shelf.

4. GOVERNANCE FRAMEWORK/APPROACH

As an EC Regulation, the present CFP closure around the Darwin Mounds is directly binding on EC Member States. In contrast, the SAC designation process currently underway is generally more drawn-out as it involves the translation of the Habitats Directive into national legislation. As mentioned above, this required redrafting the UK's national implementation legislation to be applicable out to the 200nm extent of the UK's EEZ. Consequently there was significant political will to close the area to bottom trawling through the CFP when the revised version came out in 2002 as it provided an immediate 'emergency closure' mechanism.

Devolution in the UK has resulted in a more complicated governance framework than apparent at first glance. The UK Department for the Environment, Food and Rural Affairs (DEFRA) is the body responsible for implementing environmental and fisheries legislation, but it devolves authority to other bodies where applicable. Currently, DEFRA is working in partnership with Natural England and the Joint Nature Conservation Committee to select and implement Marine Conservation Zones (MPAs under the new UK Marine and Coastal Access Bill) across the DEFRA marine area (defined as English territorial waters and offshore waters adjacent to England, Wales and Northern Ireland). Thus in waters adjacent to Scotland (both inshore and offshore), the relevant authority is the Scottish Executive and Scotland has produced its own Marine (Scotland) Bill and relevant management authority (Marine Scotland), mirroring the Marine Management Organisation established by the UK Marine and Coastal Access Bill as its principle delivery body in the marine area. Marine Scotland Compliance[11], an enforcement division of Marine Scotland, has been tasked with monitoring and enforcing the Darwin Mounds closure, and it uses satellite-based Vessel Monitoring System (VMS) data and air and sea patrols to monitor the area.

The question of governance in European marine environmental management raises an important issue about the bifurcation of nature conservation and fisheries management in Europe. An inherent tension exists between legal approaches to nature conservation and fisheries management in Europe, as the former remains the remit of Member States while the latter is under the exclusive legislative jurisdiction of the European Community. This tension is of particular importance when addressing the conservation of habitats or species that are under threat from fishing activities (De Santo and Jones, 2007b). The emergency closure mechanism within the revised 2002 CFP allowed for the closure of the Darwin Mounds area when it would have taken years to get the area approved as a SAC under the Habitats Directive. Consequently this emergency closure mechanism provided a way to bridge the gap between nature conservation and fisheries management in a situation where the latter was affecting the former, but the mechanism has not been used successfully since. Unfortunately this raises questions about the effective implementation of a precautionary approach and the science-policy interface in European marine environmental decision-making (De Santo, *in press*).

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[10] House of Commons Energy and Climate Change Committee, UK Offshore Oil and Gas, First Report of Session 2008-2009, Volume 1, 30 June 2009.

[11] Formerly known as the Scottish Fisheries Protection Agency, before the Marine (Scotland) Bill and establishment of Marine Scotland.

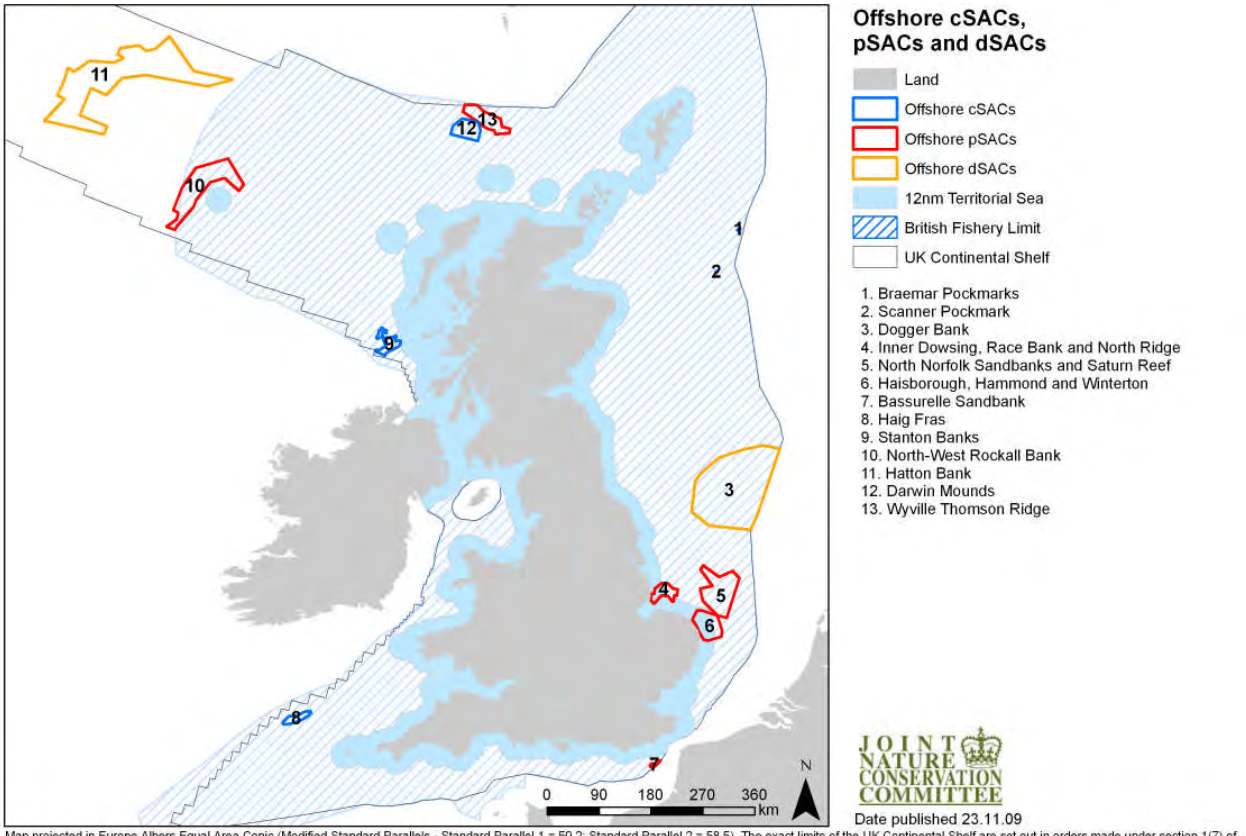
5. EFFECTIVENESS

There has been some discussion (Davies *et al.*, 2007) about whether fishing efforts in the area actually increased in the months leading to the closure, as fishermen became aware that the area was going to be closed off, however the proponents of this theory admit their evidence is not robust and they also fail to distinguish between VMS data for vessels conducting pelagic trawling versus bottom trawling. According to enforcement officials from Marine Scotland Compliance (interviewed in my doctoral research in 2006 and subsequently updated in 2009), there have been no infringements of the MPA since its establishment. Under Scottish law, two pieces of evidence are required for conviction in a Scottish court – consequently if a vessel was trawling illegally in the area, Marine Scotland Compliance would need VMS evidence and an observation, by sea or air, for conviction. As mentioned earlier, this agency undertakes all three methods of surveillance, the primary being VMS, followed by sea and air patrols. Given the area is open to pelagic fishing, it is monitored for vessels travelling at a speed of less than five knots; this would indicate bottom trawling activity. It is also worth mentioning that Darwin Mounds area is relatively small, representing 0.13% of the UK Continental Shelf.

However Marine Scotland Compliance is also responsible for enforcing and NEAFC[12] closures in the North-East Atlantic. As of 2008, the UK has submitted five offshore MPAs as candidate SACs under the Habitats Directive, and a further eight sights are in consideration by the UK government to be put forward. As shown in Figure 5, several of these fall within Scottish waters under the surveillance of Marine Scotland Compliance. In addition, Marine Scotland Compliance also assists with monitoring and enforcement for NEAFC closures, illustrated in Figure 6, focusing primarily on the areas closest to UK waters (i.e. the Hatton Bank/Rockall closures, for which the UK shares enforcement responsibility with Ireland). Given the increase in offshore sites within the jurisdiction of Marine Scotland Compliance, it is unfortunate that additional resources have not been provided to support monitoring and enforcing these sites.

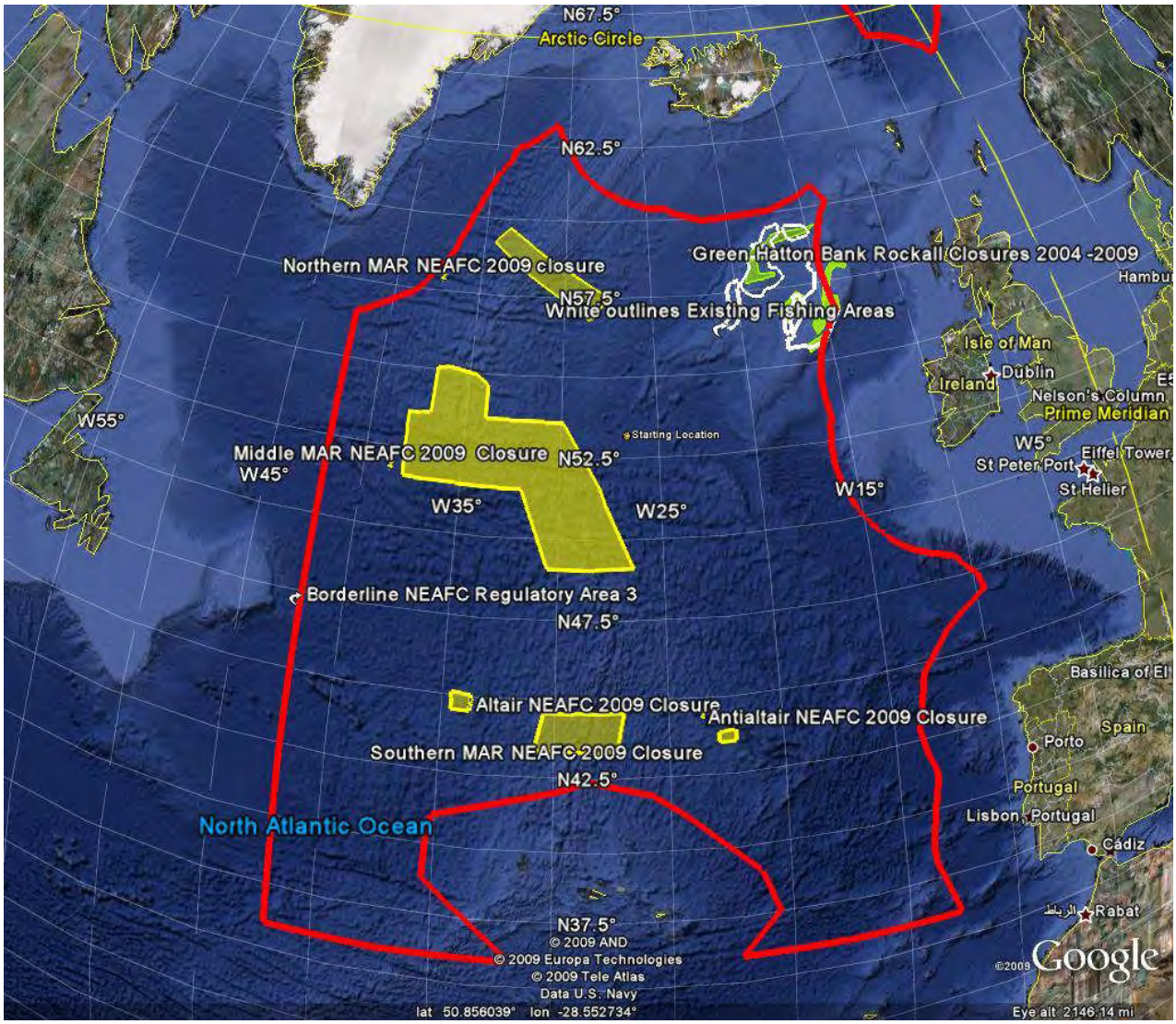
[12] The North-East Atlantic Fisheries Commission.

Figure 5: UK Offshore SACs (existing and proposed) under the Habitats Directive



Map projected in Europe Albers Equal Area Conic (Modified Standard Parallels - Standard Parallel 1 = 50.2; Standard Parallel 2 = 58.5). The exact limits of the UK Continental Shelf are set out in orders made under section 1(7) of the Continental Shelf Act 1964 (© Crown Copyright). World Vector Shoreline © US Defense Mapping Agency. Map copyright JNCC 2009. AR 23/11/2009

Figure 6: NEAFC closures



Source: http://www.neafc.org/system/files/vmes_press_rel_april2009.pdf

6. INCENTIVES

Legal incentives

Legal incentives were by far the strongest force for protecting the Darwin Mounds, as the UK was under a legal obligation to (1) protect cold-water corals under the Habitats Directive and (2) apply the Habitats Directive throughout its EEZ following the 1999 Greenpeace Judgment. At the same time, the revised CFP released in 2002 provided a mechanism for closing the area faster than would be possible under the Habitats Directive, which also showed a 'greening' of the CFP, not to mention the UK's environmental leadership within the CFP compared with other Member States. In addition, as the Darwin Mounds along with other UK SACs, has been put forward as an OSPAR MPA as well, this closure has also helped the UK meet its obligation as a party to the OSPAR convention and its work towards establishing a network of OSPAR MPAs by 2010.

The legal framework underlying this MPA is described earlier, and involves international, regional and national obligations. In terms of *Fairness* there is a clear procedure for prosecuting infringements of the Darwin Mounds MPA, but there is less of a discussion with stakeholders, both on the user end (*i.e.* fishing industry) and the public at large. In my research on this area, it became clear that the fishing industry felt the protected area was 'a done deal' on the part of the government by the time they were brought into the

conversation. Improving good will is important for compliance. This point is also important in terms of *Transparency* – a lack of knowledge sharing or involvement of outside parties in decision-making can be seen as a reaction to security concerns (*i.e.* territorial claims offshore for resource extraction, and the potential for international conflict etc.).

Interpretative incentives

The role of conservation champions was a key incentive in getting the Darwin Mounds area protected, as mentioned earlier (the Greenpeace campaign on offshore drilling on the UK continental shelf and subsequent Greenpeace Judgment as well as the WWF North-East Atlantic MPA campaign that followed). In addition, the news media was an important player, as the discovery of the Darwin Mounds was heralded at the time as "Scotland's Barrier Reef" in the press. Photographic evidence of the effects of bottom-trawling on coral reefs in general also had a strong impact on European Commissioners, in conjunction with the perceived "uniqueness" of the site and clear evidence of damage caused by bottom-trawling fisheries.

In terms of *Direction*, offshore conservation is not something most people are aware of or feel a connection to. Hence in the future, a closer tie between offshore fishing and nature conservation and the public (*i.e.* fish consumers) could be improved through eco-labelling and associated campaigns, for example. In terms of *Transparency*, again the offshore environment is difficult as decision-making in this region is not open to examination the way inshore areas are. As offshore development progresses, the number of affected stakeholders will increase and consequently broader interests will have to be taken into consideration when designating MPAs in offshore waters.

Knowledge incentives

The offshore zone provides unique challenges to transparency – it is physically 'out of sight, out of mind' for most people, and benthic habitats in deep waters are even more so. In the case of the Darwin Mounds, a "precautionary" approach was relatively straightforward to implement, as damage to the Mounds caused by bottom-trawling was observed when the area was revisited in 2000. At the same time however, whether this was truly a "precautionary" approach is debateable as the evidence of trawling damage was clear and thus one can argue that it was an evidence-based decision. It depends on one's interpretation of the meaning of the precautionary principle. For future offshore designations, taking a truly precautionary approach, *i.e.* acting in the face of uncertainty, will be increasingly important, especially given the remoteness of these areas and lack of knowledge/certainty we have about deep-sea ecosystems.

As mentioned in the previous section, *Transparency* in the decision-making process is an issue, but as the number of stakeholders in offshore management increases (as will likely occur with increased development and wind farms etc), increased education, outreach and partnership will be essential.

Economic incentives

In the case of the Darwin Mounds, economic incentives did not play a role in the designation process. However they were used as a bargaining tool during the negotiation phase. Spain successfully argued for pelagic fishing to be allowed to continue in the region, even though it does not constitute a major fishery. While this may be seen as an economic argument, it was actually political (*i.e.* not giving up ground on the Commission level).

For the offshore zone in general, economic incentives will have a larger role to play in other examples and in coming years, especially with the development of offshore wind farms and the displacement of fisheries further from shore. The creation of refugia offshore will play an important role in management, as will aquaculture.

In terms of *Performance*, the Darwin Mounds area is policed by the Scottish Fisheries Protection Agency, which is funded by the UK government. It is a well-financed operation compared with what might be found in other offshore areas.

Participative incentives

For the Darwin Mounds, participative incentives did not play a significant role. While collaboration between industry and scientists led to the discovery of the Darwin Mounds, the issues surrounding the

designation of the MPA were contained within the UK government and EC Commission, without stakeholder consultation. New EC legislation requiring greater stakeholder participation, i.e. the Marine Strategy Framework Directive and the Integrated Maritime Policy, may help coordinate linkages between stakeholders and the policy process throughout EC waters, including offshore areas.

This incentive is a challenge in the offshore zone – it feels and is remote. As more offshore MPAs are designated, there may be pressure from the user and NGO communities to have greater participation of stakeholders in the decision-making process.

7. KEY ISSUES

To summarize, the key issues arising from the designation of the Darwin Mounds MPA and this incentives-based analysis are as follows:

1. Offshore MPAs require a strong regulatory basis and financial/political commitment to enforcement and monitoring.
2. The further you move offshore, the greater the uncertainty and need for a precautionary approach. It may also be the case that a greater willingness to compromise on the extent and size of closures is also required, as this was true for the Darwin Mounds.
3. In addition, transparency in the policy process is reduced for offshore MPAs and this is an issue that needs to be addressed in the way that stakeholder consultation is are built into the legislative process. A more 'balanced' approach to the different uses of and priorities in offshore areas needs to be achieved, especially as European Member States move towards comprehensive Maritime Spatial Planning approaches.

APPENDIX

CROSS-CUTTING ISSUES/FACTORS

1. Leadership

- *Strong leadership for the MPA, e.g. from particular people within the community of from local/national/international NGO, agency and political levels*
- *Long-term vision, consistency and stability of the leadership*
- *Role of the leadership in facilitating the use of above incentives and bringing good MPA governance*

For the Darwin Mounds, there was strong leadership from within the UK regulatory community which enabled the closure. The further offshore the MPA, the greater the need for strong, top-down management and leadership.

2. Role of NGOs

- *What role(s) do NGOs play in the use of above incentives?*
- *What are the role(s) of NGO(s) with government agencies and other parties in MPA decision-making and governance*

As mentioned above, Greenpeace and WWF were involved in the underlying incentives that led to the Darwin Mounds closure. It is thus clear that for the UK, environmental NGOs can play a significant role in pressuring the government to conserve marine areas, especially when a legal argument is made.

3. Equity

- *Are there any groups/communities who are further marginalised or disempowered as a result of the use/lack of the above incentives? In what ways?*
- *Does inequity undermine the effectiveness of some of the above incentives and the achievement of MPA objectives? If yes, how?*
- *How significant an issue is (in)equity in your case study?*

- *Is (in)equity less of an issue in more economically developed countries where there are social welfare 'safety nets' and a wider diversity of alternative income opportunities?*

In my interviews with representatives from the fishing industry, it was apparent that they felt somewhat marginalised by the Darwin Mounds closure, as it was 'a done deal' by the time they learned it was coming. This has important implications for the designation of future offshore sites, however given the increased role of stakeholder participation in the new Marine Strategy Framework Directive and the plans for Maritime Spatial Planning within the new Integrated Maritime Policy, it seems likely that the offshore fishing industry will be more included in future decisions.

4. Stewardship

MPA designation can undermine the sense of ownership or of stewardship values that users might hold towards 'their' marine area as it becomes subject to more state controls to achieve wider objectives. This sense of ownership can be (re)generated by certain incentives – stakeholder participation, local protectionism from incoming users, provision of property rights, etc and undermined by other incentives – state control, etc this can be an important issue for some MPAs. How significant an issue is stewardship or sense of ownership in your case study MPA?

For the Darwin Mounds, there was a degree of national pride that helped facilitate the closure, as it showed the UK to be 'gold-plating' EC regulations, and it is a site that is also included within both the Habitats Directive and OSPAR networks of MPAs. As more MPAs are designated offshore, the role of ownership should be increased where possible, including on a public/stakeholder level, to facilitate effective maritime spatial planning and attainment/enforcement of conservation objectives throughout Member State EEZs.

North East Kent European Marine Site
Governance Analysis

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Information is based on data collected as part of my PhD research between January 2006 and January 2009. The Research was funded by the Economic and Social Research Council and Natural England.

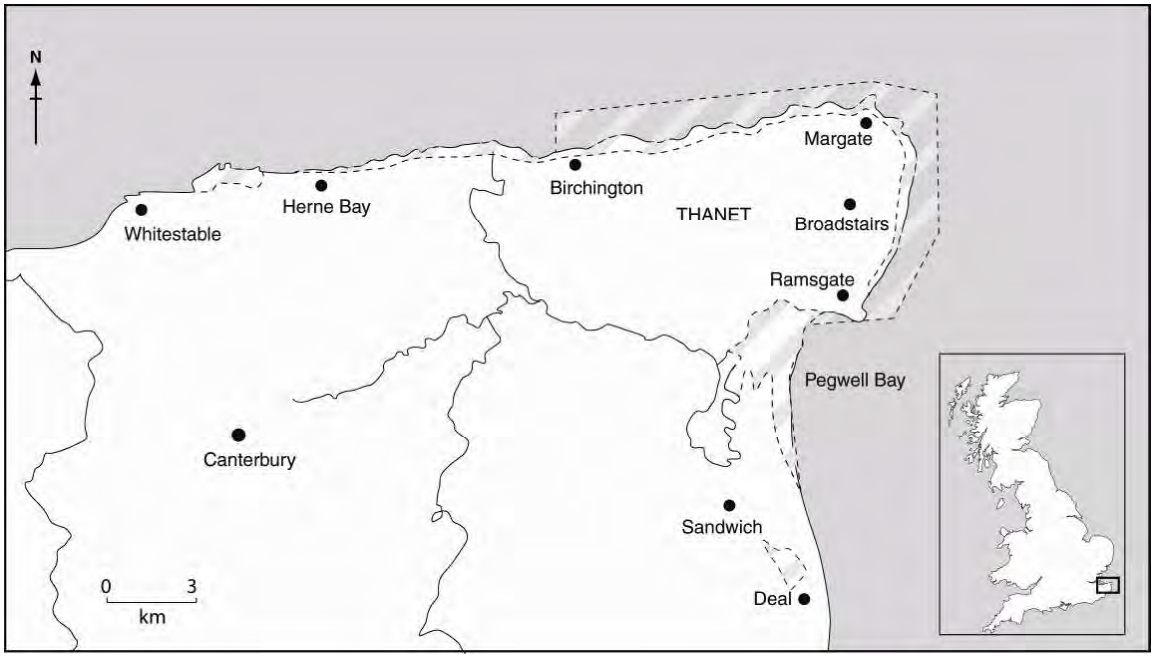
1. CONTEXT

The North East Kent European Marine Site was first designated in 1995 and the management scheme was eventually launched in 2000. This was largely due to the number of assessments which had to be completed and the challenges related to building partnership capacity and overcoming the conflicts between stakeholders.

The site covers an area of 2269ha of coastline and intertidal area stretching from Herne Bay to Deal with a small separate area at Swalecliff. It also extends out to sea for up to 2km around Thanet and includes several overlapping designations:

- Thanet Coast Special Area of Conservation (SAC)
- Thanet Coast and Sandwich Bay Special Protected Area (SPA)
- Sandwich Bay SAC

Map North-East Kent European Marine Site situated on the South-East Coast of England:



Thanet is widely recognised as being the most economically deprived area within the county of Kent[13]. In an attempt to reverse this situation Thanet District Council has long pursued an agenda based around economic regeneration and development. The island geography of Thanet has given the people of Thanet a strong sense of local identity. The area is still known as the Isle of Thanet, a title reinforced by the local newspaper, the Isle of Thanet Gazette. There remains a sense in which Thanet is seen as being removed from the rest of Kent; amongst the older generation there are those that can remember having to show their identity card when crossing the Wantsum Channel during the Second World War. The sense of detachment and identity associated with an island community has been reinforced by the isolation of Thanet's economic decline amongst the relative prosperity of surrounding Kent. Together, the relative isolation and economic standing of the area has led to a defensive local community that might regard 'outside' input as unhelpful and ignorant of Thanet's needs and history (Gardner 2005).

Although the Isle of Thanet is largely an area of arable farming, the coastline is dominated by an urban fringe that runs almost unbroken around the eastern point. The three towns of Margate, Broadstairs and Ramsgate make up the bulk of Thanet's population of 126, 702 (TDC 2004) with a population density of 12.36 persons per hectare (compared to the Kent average of 3.54 persons per hectare) (TDC 2004). This population is seen to rise dramatically over the summer months as over 1.7 million day visitors come to the region.

Historically Thanet's economy has been based on the tourist income associated with the traditional English seaside resorts of Ramsgate, Margate and Broadstairs. Over the years this has been supported by Ramsgate Harbour, which at one time handled both passengers and freight, and by a medium-sized fishing fleet of approximately forty boats. However, in recent years the number of visitors coming to Thanet has steadily declined and of those that do choose to visit, few stay overnight. The decline of the tourist industry and the absence of any significant alternative economy have left Thanet as one of the two poorest areas in South East England, a position borne out by its receipt of European Objective 2 funding.

2. OBJECTIVES

The Thanet Coast SAC qualifies for the following Annex I habitats as listed in the Habitats Directive:

- Reefs
- Submerged or partially submerged sea caves.

The Sandwich Bay SAC qualifies for the various dune habitats that run along the back of the bay, whilst the Thanet Coast and Sandwich Bay Special Protection Area is designated for three bird species (English Nature 2000):

- Breeding little tern (*Sterna albifrons*)
- Wintering golden plover (*Pluvialis apricaria*)
- Wintering turnstone (*Arenaria interpris*)

As the map shows, the majority of the EMS is situated around the coast of the Isle of Thanet. The region is

[13] Thanet is Kent's most deprived district and ranks 60th in a list of England's most deprived local authority districts. This description is explained by the fact that Thanet scores in the 25% most deprived districts in all six deprivation categories (employment, education skill, training, geographical access to services and income and health deprivation and disability) (TDC 2004). Incidence of violent crime in Thanet in the period 2000/01 was 14.1 per 1000 population. This is 47% above the county average and 24% above the national average (Thanet Community Safety Partnership 2002). A study by Beatty and Fothergill (2003:57) of the economies of seaside town describe Thanet as having a real unemployment figure of 5.4% (and a real figure of 11.7%). This compares to a figure for Kent of 1.9%. The dominant theme to emerge from amongst these and additional statistics is that Thanet stands out as being particularly deprived within the county of Kent.

bordered along two sides by the English Channel and on a third by the River Wantsum. This river began silting up in 1499; prior to this it had been known as the Wantsum Channel and had effectively separated Thanet from the rest of Kent. The coastline forms a peninsula stretching from Herne Bay in the North round to Sandwich Bay in the south. Consisting of soft chalk cliffs and sheltered bays, the Thanet coast has provided safe points of harbour for hundreds of years. St. Augustus landed at Pegwell Bay in 596 AD, whilst Ernest Shackleton set sail on Endeavour from Margate. The coastline of Thanet is dominated by 23km of continuous chalk cliff, representing 20% of the coastal chalk in Britain (NEKEMS Management scheme 2007). Equally distinctive, although not so obvious, are over 250 hectares of chalk reef, some of which is exposed only during spring tides (Gardner 2005).

3. DRIVERS/CONFLICTS

During the late 1990s successive planning proposals by TDC resulted in two long running public debates between the local authority and the then NCA (Jones et al. 2001). The first of these related to a proposed sea wall across one of the last remaining stretches of chalk cliff, while the second concerned the building of an approach road to Ramsgate that would destroy cliffs and caves. It quickly became clear to campaign groups, such as the Pegwell and District Association, that the proposed 18 metre wide sea wall was simply another way of TDC ensuring the approach road was built (Gardner 2005). This proposal eventually collapsed without getting to the Public Inquiry stage. Instead it simply eroded already poor levels of trust between local campaign groups and the members of TDC. Both disputes provoked widespread public interest with headlines such as *Green Slime Versus Jobs* appearing in the local paper (Jones 1999b).[14] The decline in relations between the NCA and the local authority as a result of these protracted debates is widely acknowledged on both sides.

The designation of the EMS in the mid 1990s initially exacerbated the difficult relationship between TDC and the NCA. The high level of tension which had developed between TDC and NCA as a result of the past planning disputes meant that the first priority was to encourage the RAs to communicate with each other. Furthermore, there was also significant disagreement amongst local stakeholders and therefore it was necessary to engage them in discussions regarding the implications and scope of the designation.

Two relevant authorities reacted to the designation by lodging objections with the Secretary of State for the Environment. Both TDC and the Thanet District Council Harbour Authority opposed the designation of the Thanet Coast EMS. The port authorities were concerned about how their current and future activities might be impinged on by the surrounding conservation designation. TDC had specific concerns regarding any future development of Ramsgate Harbour and more widely with regard to the implications for the economic regeneration of the area. In addition to their concerns regarding the potential for future development, TDC were reluctant to divert any of their limited resources towards the designation. After lengthy discussions between the council and the NCA it was eventually agreed that the only way forward would be to integrate the development of the management scheme with the application for objective 2 funding to boost economic development in the area (Gardner 2005). As a result consultants were hired to develop and run a stakeholder dialogue process to facilitate discussion and come up with a workable management scheme.

4. GOVERNANCE FRAMEWORK/APPROACH

The site was first designated in 1995 and the management scheme was eventually launched in 2000. This was largely due to the number of assessments which had to be completed and the challenges related to building partnership capacity and overcoming the conflicts between stakeholders.

The management group is comprised of 'relevant authorities':

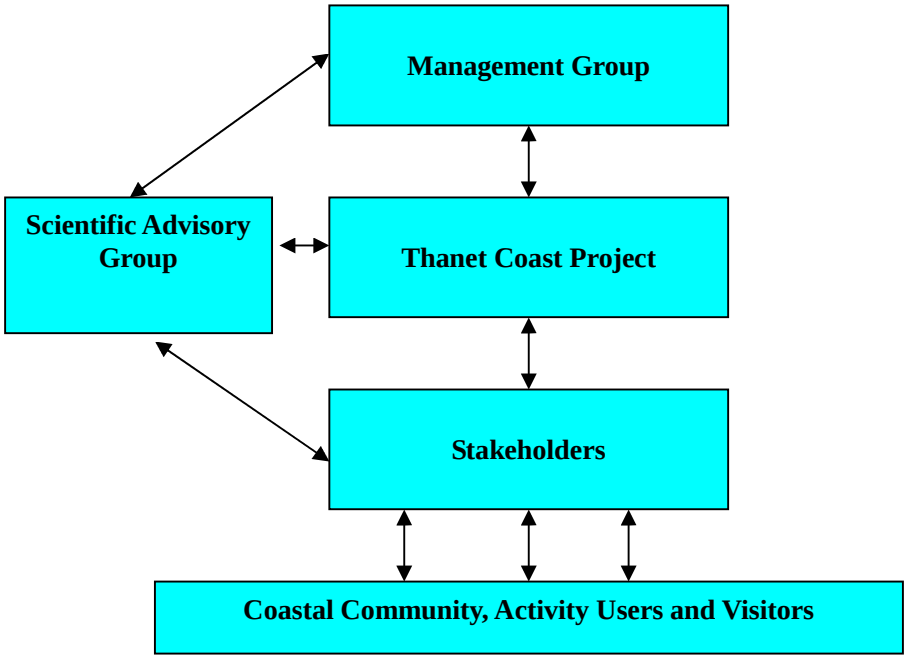
- Natural England
- Kent County Council

[14] This referred to a specialist species of the *Chrysophycease* algae protected by SSSI status (SSSI Notification 1990).

- Thanet District Council
- Dover District Council
- Canterbury City Council
- Environment Agency
- Southern Water Services
- Thanet District Council Harbour Authority
- Sandwich Port and Haven Commission
- Kent and Essex Sea Fisheries Committee

The consultation on the management scheme was conducted through one off events, however, bi-annual meetings are held to provide stakeholders with regular opportunities to feed their thoughts and concerns in to the management process. As Figure 1 demonstrates, the TCP acts as a go-between between stakeholders and the management group. The management group is also supported by a scientific advisory group which consists of local scientists with an interest in the site. Stakeholders with specific knowledge of aspects of the site are also able to present their ideas and concerns about the site to the management group through the scientific advisory group.

Figure 1 NE Kent European Marine Site management structure:



Thanet Coast Project (TCP)

One of the outcomes of the workshops was the proposal to set up a community based project to take forward many of the wildlife related actions in the management scheme that were not being dealt with by other organisations. As a result in July 2001 the TCP was established. The project's remit is to (TCP 2005):

- Make people more aware of the importance of the bird and marine life and how to avoid damaging it.

- Implement Management Scheme action e.g. help local users produce, follow and monitor codes of conduct
- Encourage and run wildlife related events and make links with wildlife and green tourism and the arts
- Be a focal point for enquiries and gather information on coastal wildlife
- Keep people informed e.g. newsletters, articles and stakeholder meetings to keep everyone up to date with progress.

The project has grown considerably over the past 7 years and now employs two full time members of staff, a project manager and an education officer. The project has:

- Dramatically raising the profile of coastal nature conservation in North East Kent, worked closely with stakeholders to over-come conflicts of interests and produced a list of voluntary codes for coastal users,
- Developed a regular programme of stakeholder meetings giving local people a regular opportunity to feed their thoughts and knowledge in to the management of the area,
- Developed a highly successful coast warden's scheme which has trained over 100 people to get involved in informing the public about the coast and monitoring the state of the site
- Put on numerous events and activities to encourage people to get more involved with managing the site.

5. EFFECTIVENESS

The MPA is currently at about level 3 on the scale, *'some impacts completely addressed, some are partly addressed'*. Its effectiveness can be measured in three areas:

Community engagement

The NE Kent EMS has been extremely effective in engaging with a large number of stakeholders and getting people interested/involved with protecting the marine environment. The TCP has successfully developed a high level of trust between local community groups and the RAs. Furthermore, the increased knowledge about the marine environment now possessed by stakeholder groups who use the marine environment and the public more generally has led to a dramatic improvement in the way the majority of people treated the coast. However, there is still concern that the legislation is not strong enough to enforce the regulations against those people who continue to abuse the environment.

Promoting sustainable economic development

The MPA has been successful in engaging with the local authority and local businesses to persuade them that economic development and conservation interests can work together. This has been highlighted by the recent growth in green tourism and people visiting the area to view specific aspects of the natural environment such as the large colonies of seals and sea birds.

Biodiversity conservation

There is strong evidence to suggest that the little tern populations have started to recover as a result of information provided to the public as a result of the EMS designation. Previously the nesting birds were subject to large amounts of disturbance impacting on their ability to reproduce. Furthermore, the increased dialogue about the sea defences has led to a halt in the building of new defences, reducing the damage to the chalk reef. However, the existing defences are still being maintained so the reef is still under threat.

6. INCENTIVES

Economic incentives

As described above the initial barriers to designating the site as an MPA were largely related to concerns that it would undermine the economic development of the area. Consequently demonstrating the economic benefits of the designation to the stakeholders (particularly the local authority) has been key to its success. In particular the incorporation of European Objective 2 funding in to the initial management scheme was a major incentive for the local authority to support the designation. This concept of economic development working in tandem with conservation has been central to the development of the MPA.

Historically the local authority has seen conservation and economic development as mutually exclusive, however through the work of the Thanet Coast project the local authority have began to see the coastline as there biggest asset rather than a burden. With the rapid decline of the traditional sea side tourism industry the local authority and Thanet Coast project have been to promote the area as an interesting more up market 'eco tourism' and cultural destination, focusing on the unique chalk cliffs and the areas historical relationship with Turner and Dickens.

In addition, the improving profile of the area has caught the attention of a number of film and advertising companies who are increasingly using the beaches for filming, bring a welcome boost to the local economy.

Participative incentives

Collaborative management has been central to the success of the MPA. For the first time all the relevant authorities have been working together to develop a strategic management plan for the site. Furthermore, as a requirement for public consultation was written ion to the Habitats Regulations the wider community have also been intimately involved with the planning and implementation of the plan. This has resulted in a high level of public support for the designation. The collaborative management has also led to the development of a high level of trust or social capital developing between the relevant authorities and local population.

To date to management schemes have been developed for the site, the first in 2001 and the new reviewed management scheme in 2006. Both these plans were developed through a process of stakeholder dialogue which involved the relevant authorities and stakeholders meeting on three occasions to discuss the priorities for the management scheme within the framework outlined in the Habitats Regulations. This participatory process as successfully provided stakeholders with a sense of ownership of the scheme. In addition to the 5 yearly reviews of the management scheme there are regular stakeholder meetings (at least every 6 months) to provide stakeholders with the opportunity to feed back to the management group. Furthermore, the Thanet Coast project officer are constantly available to talk with stakeholders about issues related to the management of the site.

Interpretative Incentives

Interpretive incentives have been vitally important to the success of the MPA project. It has been widely acknowledged by a number of the main actors involved that a major barrier to conserving the area prior to the implementation of the current project was that many people didn't see it as having any real value.

Through the Thanet Coast project numerous education programmes have been set up including rock pool activities for children, coastal art projects, community information walks and a coastal warden's scheme.

The warden's scheme has been particularly effective in engaging over 100 local people to act as champions for the MPA. The wardens attend a basic training course which covers coastal ecology surveying skills advice on health and safety. They are then assigned a section of coastline and asked to carry out regular surveys and

report on illegal and anti-social behaviour. The wardens also engage with other coastal users and provide them with more information about the area. They also have the opportunity to attend further courses to enhance there skills and take on more complex assignments.

Knowledge incentives

The process of developing the management scheme for the area required the relevant authorities (initially led my Natural England and now coordinated by Thanet District Council) to pull together a wide rang of information about the site, including particularly vulnerable features. However, uncertainty still remains a big concern, particularly related to the impact of pollution, sea level rise and other influences which remain outside the control of the MPA. These concerns formed the basis of the decision to adopt an 'ecosystem approach' to the management of the sight as part of the latest review of the management scheme. The principle behind this was to try and employ a more holistic approach to the conservation of the designated features by looking at there management in the context of the wider ecosystem.

The Thanet coast project has been working very closely with other groups such as the local wildlife trust and groups of scientific advisers to try and co-ordinate knowledge about the area. Furthermore, a significant about of new data is being generated by the survey completed by the coastal wardens. There has also been a real emphasis on making new discoveries about the area and communicating them in an interesting and exciting way to the general public to keep them interested and enthused about the site.

Legal Incentives

The North East Kent European Marine Site is ultimately governed by the 1992 European Habitats Directive. The Directive became law in the UK in 1994[15] and was amended in 1997 and (in England only) in 2000.[16] The purpose behind the regulations was to implement the aspects of the Habitats and Birds Directive not already included in national legislation. To some extent the regulations can be seen as an attempt to update and improve upon the protection provided by the 1981 Wildlife and Countryside Act.

The Regulations required that any plans or projects which might have a significant effect on the designated sites should be assessed and these activities should only go ahead '*for imperative reasons of overriding public interest, including those of a social or economic nature'* (Article 6 (4)), subject to appropriate compensatory measures. There is now significant case law within the UK which demonstrates that the Secretary of State is prepared to uphold this legislation even in the face of strong opposition from resource users (see Wash case study below and Roberts and Jones 2009).

7. KEY ISSUES

Overall, the vast majority of stakeholders appear to be content with the management scheme and the management of the site. They felt that the profile of conservation had been raised considerably since the designation of the EMS and both the community and the natural environment were in a better position as a result. However a number of challenges still remain:

Macro challenges

[15] HMSO (1994) The Conservation (Natural Habitats &c.) Regulations 1994. Statutory Instrument No. 2716. HMSO, London.

[16] Statutory Instrument 1997 No. 3055 and Statutory Instrument 2000 No. 192. The Conservation (Natural Habitat, etc.) Regulations (Northern Ireland) came into force on 13 November 1995 and replicate the provisions in force in the GB Regulations, applying them to the separate legal system existing in Northern Ireland. Directive 92/43/EEC was transposed into the laws of Gibraltar on 25 August 1995 by the Nature Protection Ordinance (Amendment) Regulations 1995 (Defra, September 2001).

Climate change

The area designated as the NE Kent EMS is one of the most likely areas in the UK to feel the pressures of climate change related issues such as rising sea level. A recent study by the World Development Movement suggests that by 2080 much of the area surrounding the NE Kent EMS will be below sea level. As mentioned above, in the past aggressive measures have been put in place to protect Thanet from coastal erosion. However, the maintenance of these defences is not sustainable in the long term.

As a result, difficult decisions will have to be made regarding the managed realignment of the coast. Ultimately human concerns such as the protection of property will have to be weighed up against environmental concerns such as the protection of the chalk reef.

Other external impacts effecting the European Marine Site

As a result of the decision to adopt the ecosystem approach, many of the stakeholders have been thinking more widely about impacts on the site from outside its boundaries. A number of stakeholders commented that they were concerned with the level of pollution from shipping in the English Chanel: These concerns were realised in January 2009 when a huge quantity of timber broke free from a vessel in the Channel and ended up on beaches around Thanet. Furthermore, the stakeholders were concerned that there was little they could do to mitigate against these threats.

Of particular concern to the scientific advisory group was the increased number of non-native species which are being recorded around the site. It is clear these are having an impact on native species. For example, native oysters are being decimated by the increase in the number of Portuguese oysters. It is clear that this problem is at least in part related to climate change, but there is also evidence to suggest that many of the non-native species arrive in the area in the ballast tanks of large ships.

Micro challenges

Behaviour of Stakeholders

Issues, such as driving on the peer, the use of mini motos on the beach, irresponsible dog owners, and jet skis were considered to still be creating a significant disturbance which was having a negative impact on wildlife and nesting birds in particular. These issues were recognised by the TCP which plans to extend its education programme to reach out to a wider range of people. It was also hoped that new legislation forthcoming in the proposed Marine Bill would give authorities more power to clamp down on such activities.

Many stakeholders also complained about the rising number of 'immigrant gangs' who come in from outside the area to collect shellfish from the foreshore. This appeared to provoke an angry reaction from many people, although the reasons are less easy to define. While some appeared genuinely concerned that they were damaging the biodiversity of the site and worried about their safety, '*it's a disaster waiting to happen, Do you remember what happened to the cockle pickers at Morecombe Bay? Well I'm worried that the same thing will happen here*.' (Coastal Warden). However, others seemed more concerned by the fact that they were 'immigrants': 'S*ometimes it feels like an invasion. We get hundreds of Chinese and Eastern Europeans down here stripping the foreshore. They have no right to be here. I'm sure most of them are illegals'* (Local Resident). The scientific community was keen to establish some data on the extent of the problem and the impact it was having on the site. Currently there are a number of monitoring programmes in place which are due to report in 2009.

Enforcement

These issues related to the behaviour of coastal users also provoked many stakeholders to raise issues about the enforcement of the legislation. There was concern that the legislation does not give the authorities enough power to stop people engaging in damaging activities such as collecting shellfish from the

foreshore. There was also a number of disagreements between the RAs about who was responsible for regulating particular activities.

This clearly demonstrates that although the partnership has increased the levels of co-operation between agencies there is still room for improvement and a need to clarify which organisations are responsible for managing activities.

In relation to the problems relating to other forms of unacceptable behaviour, the TCP officer responded by saying that they were working closely with the local police to educate Community Support Officers about coastal issues and they were hoping to set up patrols along the coast.

Pressure from development

As outlined in Chapter 4, historically conflicts between economic development and conservation have been the root cause of many problems. The stakeholders clearly recognised that the situation is now far better than it was in the 1980s and 1990s. However, a number still remained concerned that pressure from economic development still represents a major challenge to the site. Once again the TCP was seen as the key to ensuring that any development was sustainable by continuing to raise the profile of the coast and conservation and making sure they were taken into consideration when planning applications were being considered.

Maintaining momentum

Finally, the success of the project to date has led some stakeholders to become concerned that it may not be possible to keep the momentum going at the current rate. Others stressed the importance of keeping projects like the coastal wardens scheme going.

The Wash & North Norfolk Coast European Marine Site
Governance Analysis

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1. CONTEXT

Size of MPA – 1078 km^2

Coastline length – 160+ km

Coastal MPA that includes intertidal and subtidal habitats, but all within ~3nm of coast. This is significant as the fisheries management is under the jurisdiction of the UK government (partial EC jurisdiction under the Common Fisheries Policy beyond 6nm).

National figures (2008)

Population per km^2 – 252 people

Population growth rate – 0.28%

Per capita GDP (PPP) US$37,400

GDP growth rate – 1.1% but likely to be negative for 2009 in light of global economic slowdown.

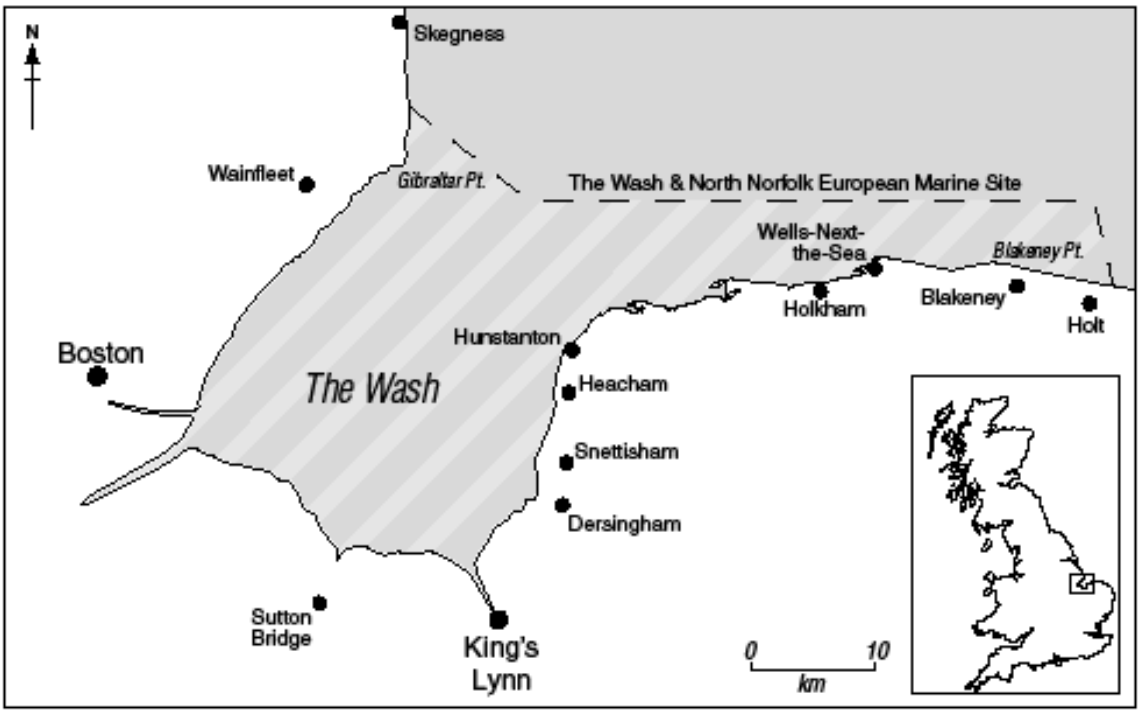
GDP Composition by Sector – Agriculture: 0.9%, Industry: 22.8%, Services: 76.2%

Labour force by occupation – agriculture: 1.4%, industry: 18.2%, services: 80.4%.

Unemployment rate – 5.5% (2006) but has now risen to 6.4% (2009) due to economic slowdown and forecast to rise further.

Government Type – Constitutional Monarchy; increasingly subject to directives from the European Union in what is becoming a form of State-Federal system

The W&NNC EMS is in a rural area with a population of around 110,000 people around it, most being employed in tourism, local government/utilities, port operations, agriculture and fishing. The fishing industry based on the Wash is worth ~£4m per annum with around 90 vessels, specialising in shrimp, cockle and mussel fishing. Traditional activities, including those based on common rights, such as samphire gathering, bait digging, wildfowling and shellfish farming/gathering, are a particularly important aspect of the local culture and economy in The Wash.



The Wash & North Norfolk European Marine Site

2. OBJECTIVES

This MPA is driven by legal obligations to the European Commission (EC) under two Directives:-

- Directive 79/409/EC on the conservation of wild birds ('Birds Directive' 1979)
- Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna ('Habitats Directive' 1992)

All countries that are part of the European Union are legally bound, under European legislation which 'member states' must comply with in order to remain in the European Union (EU), to fulfil obligations set out in various EC Directives. Failure to do so can lead to infringement proceedings, including large fines if found guilty in the European Court of Justice, as well as other significant economic and political penalties. The main protective measures are provided under the Habitats Directive and this framework represents a strong top-down federal approach to ensuring that biodiversity conservation objectives are fulfilled for both terrestrial and marine sites.

This federal approach to nature conservation is considered by the EC to be necessary to overcome national-local short-term and vested interests that have previously provided for development priorities to over-ride biodiversity conservation priorities. Activities and projects can go ahead where they are judged to be for 'imperative reasons of overriding public interest' (IROPI) but the procedure for evaluating projects is specified in the Habitats & Species Directive (Article 6) and the decision on whether a given development proposal represents IROPI can be 'called in' by the EC. Similarly, the EC has the final decision on which sites are or are not listed for protection under the Habitats and Birds Directives.

The Habitats and Birds Directives also provide for the European Commission's fulfilment of international obligations for MPAs under the CBD, the Ramsar Convention, the OSPAR Convention and the World Summit on Sustainable Development. The two Directives will also contribute to the fulfilment of obligations under the Marine Strategy Framework Directive to establish a network of MPAs and restore European seas to good environmental status by 2021.

The specific biodiversity conservation objectives for the site relate to the habitats and species that are listed in the Habitats and Birds Directives for which the site is recognised as being of importance. These are listed under four particular designations that collectively constitute the European Marine Site (EMS):-

Wash and North Norfolk Coast SAC (1078 km^2, designated 1996)
Sandbanks which are slightly covered by sea water all the time;
Mudflats and sandflats not covered by seawater at low tide;
Large shallow inlets and bays;
Reefs;
Salicornia and other annuals colonising mud and sand;
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*);
Common Seal *(Phoca vitulina)*.

The Wash SPA (622 km^2, 1988)
Internationally important breeding populations of little tern (*Sterna albifrons)* and common tern *(Sterna hirundo)* and overwintering populations of 19 other listed species.

North Norfolk Coast SPA (79 km^2, 1989)
Internationally important breeding populations of marsh harrier (*Circus aeruginosus*), avocet (*Recurvirostra avosetta)*, bittern (*Botaurus stellaris)* sandwich tern (*Sterna sandvicensis)* common tern (*S. hirundo*), and little tern (*S. albifrons*) and overwintering populations of five other listed species

Gibraltar Point SPA (0.4 km^2, 1993)
Internationally important breeding populations of little tern *(S. albifrons)* and overwintering populations of three other listed species.

The key statutory obligation under the Habitats and Birds Directives is that all these features are **maintained or restored to favourable condition** as a means of contributing to the favourable conservation status of these features across the *Natura 2000* network of the EU. The SAC requirements are much stricter and more detailed than the SPA requirements so the SAC designation in 1996 is considered to be the main starting point for this analysis

3. DRIVERS/CONFLICTS

The conservation features are listed as being vulnerable to a range of impacts, such as disturbance by recreational activities and low flying military aircraft, wind farm and gas developments, diffuse agricultural pollution and shipping incidences, but the main impacts on which EMS management has been focused are those related to shellfishing, particularly of cockles and mussels.

The Wash has supported important shellfisheries for cockles and mussels for more than a century. Two types of mussel fishery are supported: the harvesting of mussels from wild beds and the cultivation of mussels through transplanting stocks onto 'lays' on the lower shore. The cultivation of mussels in this way has been carried out since the early 1900s. Since the late 1980s, fisheries for cockles and mussels had declined sharply, leading to major die-offs of 1000s of birds of species listed for protection under the Birds Directive designation that feed on shellfish, such as oystercatchers, during three winters in the 1990s, the closure of the cockle fishery in 1997, and unprecedentedly low yields from natural mussel beds between 1993 and 1998. These fisheries have always been subject to large and unpredictable natural fluctuations, but these declines are largely driven by human over-exploitation. It is only recently that the mussel and cockle stocks have started to show signs of recovery.

These declines are related to significant changes in the methods used to exploit the shellfisheries. Prior to 1970 the fishery mainly relied on traditional methods, with much collection being carried out by hand. However, since the 1970s new equipment has been introduced, along with other mechanised and highly efficient fishing practices. Over the same period, there were also significant changes in the nature of mussel cultivation. Following the collapse of the natural fishery around the mid 1990s, the number of lays and their stocking rates increased markedly from 1997 onwards in response to the lack of mussels on the natural lays. Also, mussels are laid on lower mudflats so are immersed for longer during the tidal cycle. This not only leads to larger mussels, but also to 'clean' mussel shells that are free of encrusting barnacles, etc, as the shells grow too fast for such epifauna to establish a hold. Such large, clean mussels are increasingly demanded by markets, particularly those on mainland Europe.

The intensification of mussel production through lays has led to 'seed' mussel being gathered from outside the Wash since 1999 and re-laid for cultivation. There has also been a considerable increase in the landing from the lays, the first sale value of which has been between £0.2 and £1.6 million per year since 2001. The **key drivers** of the increased intensity of mussel farming on the Wash have thus been:-

- Increased market demand for the ‘clean’ large mussels that lays produce.
- Declines in the yield from natural mussel beds, due to a combination of factors such as overharvesting, increased bird predation, virus infestations/parasite infections and natural variability, but arguably mainly the former.
- Increased technological capacity, *eg* automatic mussel graders, equipment to lay and recover mussels, etc.

As a result of these driving forces and resultant over-exploitation, several shellfish stocks were considered to be overexploited and some conservation features for which the EMS was designated, such as the mud/sandflats from which the mussels/cockles were harvested and certain bird species that feed on such shellfish, were listed as being in ‘unfavourable declining’ condition in the official condition report that has to be submitted to the EC every 6 years, contrary to the Habitats Directive.

4. GOVERNANCE FRAMEWORK/APPROACH

The emphasis of the UK Regulations that ‘transpose’ or implement the Habitats and Birds Directives is **on the building of partnerships** to support the management of EMSs. Such partnerships are particularly appropriate for the Wash as traditionally there has been a very strong local involvement with the coastline, which has helped to create a high sense of ownership amongst the local communities, and has also resulted in strong opinions regarding the management of the area. Considering this, it is not surprising that the proposal to designate the Wash & North Norfolk Coast SAC in 1995 generated considerable concern, if not opposition, from many locals. This proposal was seen as being an imposed measure designed to modify the activities of local users. The consultation process reinforced these concerns as the proposal had been largely designed through expert opinion based on criteria in the Habitats Directive, and it soon became clear that there was little that locals could do to oppose the proposed designation, as the only basis for challenging it was to question the science on which it was based, objections based on the effects on local activities being ‘shelved’ for future consideration under the decision-making processes established under the Habitats Directive and the UK Regulations.

Having officially approved the SAC designation despite objections from many locals, efforts were focused in establishing management structures and processes for the W&NNC EMS based on the EMS partnership policy. The EMS governance structure is as follows:-

Core Management Group
6 main relevant authorities (RAs): local fisheries authority (chair), local land planning, port and nature conservation authorities & Environment Agency

Management Group
CMG members + elected local authority councillors + other RAs (land drainage, military, Crown Estate, landscape conservation) + representatives of common rightholders + chairs of advisory groups

Advisory groups (three for three distinct geographical areas)
Representatives of key direct and indirect user groups, particularly fishermen, farmers, landowners and wildfowlers + NGOs

Whilst this management structure appears to be very hierarchical, it was agreed the advisory groups would:-

- meet prior to the management group and table issues to be discussed at the management group meetings;
- be the main means of delivering a partnership approach by providing for the participation of users and drawing on their local experience and expertise.

This is in recognition that whilst the RAs can agree targets, they cannot achieve them without the support and cooperation of local users. Furthermore, the core management group was mainly focused on coordinating the implementation of decisions taken by the management group, rather than being an executive decision-making body in itself. The EMS project officer was employed by the nature conservation authority (NCA) and spent a great deal of time meeting representatives of the RAs and the local user groups, and attending user group meetings, as a means of developing partnerships with key actors.

Whilst this EMS management structure appeared to function well as a governance approach based on partnership, it remained to be seen whether the partnership was strong enough to address conflicts between biodiversity conservation objectives and resource exploitation objectives, particularly given the legal obligation for the EMS to ensure the fulfilment of the former. It is important to recognise that the 'partnership' must ensure the fulfilment of statutory biodiversity conservation obligations, *ie* to maintain the listed features in a favourable condition, and whilst some users may respect these obligations, they were imposed and not jointly agreed by the members of the partnership. As such, this might be considered to be a **statutory partnership**, though some would argue that this is an oxymoron. The EMS partnership developed a management scheme which specifies how various activities should be managed in order to ensure the fulfilment of the conservation objectives, and this was finalised and began to be implemented in 2002. This was significant as many users and RAs started to appreciate the significance of the designation and of the related biodiversity conservation obligations.

An important test of the resilience of the statutory partnership came in June 2006, when a Public Inquiry was convened to resolve a disagreement between the NCA and mussel farmers working on the Wash. The previous year the mussel farmers had applied to the NCA for permission, under the EMS regulations, to scare eider ducks of their lays using sonic wailing devices. They argued that eider numbers had increased dramatically since 2003 to a high of 3,000 individuals, and that these were over-feeding on the mussel lays, as each eider duck can consume 2.5kg of mussels per day, rendering mussel farming on the Wash economically unsustainable. However, the NCA refused their request on the grounds that the Wash is an important foraging area for a large numbers of birds, including many species listed for protection under the Birds Directive, and the use of bird scarers is likely to disturb them, to the detriment of the ecological

integrity of the site and contravening the Birds and Habitats Directives. The Inquiry took much evidence from both sides and found in favour of the NCA in recommending that all the appeals be dismissed and this decision was upheld by the Secretary of State, on the grounds that allowing the use of sonic bird scarers would contravene the Birds and Habitats Directives.

The Wash Fishermen's Association reaction in a press release was that the decision undermined the local economy and culture: "they don't want us to catch fish and they don't want us to farm mussels". The Royal Society for the Protection of Birds (NGO) supported the decision, stating that "an intensive mechanised shellfish industry is incompatible next to one of the most important areas in the UK for bird conservation". The refusal of the NCA to license the use of bird scarers and the reinforcement of this refusal by the public inquiry demonstrated that the EMS designation gave a higher priority to biodiversity conservation objectives than to resource exploitation objectives.

There were concerns that the W&NNC EMS partnership might fracture under tensions between conservation and exploitation objectives that had been revealed by this case. It appears, however, that the EMS partnership was strong enough to withstand these tensions, as interviews subsequent to the inquiry revealed that most actors continued to be willing to cooperate or comply with the EMS measures and initiatives (Roberts and Jones 2009). Some of the factors behind this are explored below through the incentives analysis, but the key factors appear to have been as follows:-

- official recognition through EMS monitoring that the mudflats and shellfish stocks had gone from 'unfavourable declining' to 'unfavourable recovering' condition, following a ten year recovery programme coordinated by the local sea fisheries authority, with the cooperation/compliance of local shellfishermen. This indicates that current levels and types of fisheries exploitation are compatible with the EMS conservation objectives;
- growing recognition amongst fishermen and the fisheries and nature conservation authorities that mutually acceptable agreements can be reached through participation and negotiations, and that recourse to legal interventions is best avoided, accepting that this will generally favour the biodiversity conservation obligations;
- many people, including local shellfishermen and smaller scale 'layers' considered that the mussel laying venture that had applied for permission to use bird scarers had become too large scale to be considered as a 'traditional' activity;
- both shellfish catches and prices in the year after the inquiry were particularly high;
- the mussel layers discovered a local source of mussel spat, where they had previously had to import spat from other areas, and this increased the profitability of their operations;
- wind farms have been proposed for the Greater Wash estuary (outside the EMS), uniting fishing and conservation interests in opposition to these proposals.

Interviews with various local users after the public inquiry indicate considerable support for and pride in the EMS designation and a feeling that the participation of local users is adequately provided for through the advisory groups. There is some frustration that the EMS is too bureaucratic and that not enough actions are implemented, particularly relating to the management of potentially damaging recreational activities such as kite boarding/buggying, dog walking, jet skiing, etc. Such activities are largely managed through voluntary codes of conduct (Good Practice Guide) but many felt that these were not adequately followed and that more enforcement is needed. There are also related concerns about apathy, particularly the smaller number of people attending the advisory groups, though some consider that this is actually an expression of satisfaction, in that if all is well there is no need to attend. **On the whole, though, the EMS partnership appears to be quite strong and to have withstood the tensions revealed by the public inquiry**.

Recent discussions (Sept 2009) with the project officer and the chair of the W&NNC EMS (latter also the chief fishery officer) provide some interesting insights and updates. One consequence of the public inquiry is that **users now appreciate the binding and potentially over-riding importance of the biodiversity conservation objectives**. For marine users unused to binding conservation objectives, given that the UK had no significant MPA designations prior to the Habitats Directive, this was a very significant realisation. They also realised that there was no point in going 'toe-to-toe' in trying to confront and overcome the RAs who were responsible for achieving these objectives. This realisation was not confined to users, as RA officers also realised that whilst official decision-making platforms such as the public inquiry would support the fulfilment of conservation objectives, driven by the obligations to the EC, such platforms

strained both resources and relations. Both users and RAs appear to have realised that 'head-to-head' negotiations were better than 'toe-to-toe' confrontations[17]. Whilst users could still challenge the scientific basis of proposals and advice concerning the significance of particular impacts, they understood that the status of the biodiversity conservation objectives could not be challenged due to the obligations to the European Commission under the Habitats and Birds Directives.

An example of how relations amongst fishermen, the NCA and the fisheries agency have been strengthened is provided by the NCA's proposal in 2003 to designate the 'Gat' mudflats as a highly no-take MPA, as part of the EMS and under the new Marine and Coastal Access Act. They assumed that because there was no TAC, no mussel harvesting was taking place. Licensed hand gathering fishermen were actually, however, illegally harvesting the Gat at certain times of the year when they knew fisheries officers were elsewhere. Fisheries officers convinced the NCA officers that such illegal harvesting would continue and that it would be better to actually regulate the fishery rather than have a 'paper' no-take MPA. They consulted hand gathering fishermen and shellfish vessel owners on the proposal to allocate a TAC of 8 te pa, but the majority of responses favoured a TAC of half this amount, to maintain higher market prices, and they agreed that a part of the Gat mudflats be no-take. Both the fisheries authority and the NCA agreed and the Gat mussel fishery was regulated on this basis. The conservation and fisheries authorities were pleased that the Gat fishery was now regulated, subject to a lower TAC than had been originally proposed, rather than being illegally exploited, and that a part of it was closed. Hand dredgers had sufficient TAC to supply the limited market and provide them with income at certain times of the year whilst the vessel dredge owners had enough TAC for mussels in other areas.

This case has served to re-strengthen relations amongst fishermen and the fisheries and nature conservation authorities, and reinforce the understanding that 'head-to-head' negotiations with flexibility on proposals and the participation of all relevant users could lead to mutually acceptable outcomes – economically sustainable fishery that is compatible with biodiversity and resource conservation objectives, where neither party would gain from 'toe-to-toe' confrontations. There are still some tensions between fishermen and the NCA, as revealed by the recent but unsuccessful attempt to prosecute two fisherman for illegal shellfishing for cockles within a closed area on the Wash. The fisheries authority pursued a prosecution under fisheries legislation, but the NCA pursued a second prosecution for the same offence, but under terrestrial nature conservation legislation that applies to the intertidal area. The case was rejected by the court as the location of the vessel was determined by sight in poor weather conditions, rather than by VMS. This case led to fishermen boycotting an open meeting concerning other marine conservation zones of national importance under the new Marine Act and the fishermen in question to dismiss the NCAs approach to partnership as 'my way or now way'. There has also been a recent decision to restrict all mussel harvesting on the Wash to hand gathering, excluding more than 10 vessels that usually harvest mussels on the Wash. These issues illustrate that tensions remain between exploitation and conservation interests, but that the W&NNC EMP partnership appears to be able to withstand these tensions.

Such tensions are inevitable where conservation objectives are given priority over resource exploitation objectives, as must be essential within any given MPA, but it would appear that the W&NNC EMS partnership is sufficiently strong to withstand these tensions and address such conflicts. This indicates that the term 'statutory partnership' is not necessarily an oxymoron, in that MPAs that are driven by and subject to top-down obligations can be governed on a collaborative and participative basis once the validity of the obligations has been accepted by users. This acceptance may be reluctant in some cases, involving 'negotiated compliance', if not 'coerced cooperation', but the W&NNC EMS appears represent a good example of how top-down and bottom-up approaches can be combined in the context of a strong state-federal policy structure.

5. EFFECTIVENESS

Whilst there are some conflicts that still need to be addressed, the EMS governance approach has been effective in addressing key conflicts between shellfish exploitation and biodiversity conservation. This is indicated by the official recognition that related conservation features are being restored to 'unfavourable

[17] These terms were derived from a report by an independent Dutch export employed to assess the state of the cockle stocks, who had seen similar realisations emerging in the Wadden Sea MPA that was designated several years prior to the W&NNC EMS.

recovering' condition, where they were previously classified as 'unfavourable declining'. There are still uncertainties concerning the causes of negative trends in some populations of listed species and the prospects for realigning sea defences to avoid the loss of intertidal habitats through 'coastal squeeze', so an overall **effectiveness score of 3**+ is assigned.

6. INCENTIVES

Economic incentives

Promoting sustainable fisheries by providing a refuge for marine organisms in no-take zones in order to safeguard and enhance harvests in adjacent fishing grounds through spill-over/export, insurance against uncertainty, increased resilience, etc

There is recognition amongst fishermen that shellfish stocks benefit from an increased spawning stock biomass but this has not been actively employed as a means of promoting the shellfisheries recovery plan or the EMS.

Promoting the 'green marketing' of tourism, fisheries, etc products from the MPA to increase profits through price premiums

The EMS designation is employed to promote local tourism as the visitors to the area include many who appreciate nature and the countryside, including bird and seal watching, but there have not been any initiatives to promote the green marketing of shellfish derived from the Wash through local marketing schemes and gaining Marine Stewardship Council accreditation.

Many fishermen have realised, however, that restricting catches of certain stocks, particularly shellfish, as part of the shellfisheries recovery plan, has served to maintain market prices by ensuring that excessive competitive harvesting does not lead to over-supply.

Assigning property rights for certain marine areas and fisheries to appropriate groups of people to promote ownership, stewardship, rational self-interest in sustainable exploitation, etc

Inshore fishing licences confer access to certain users and these can be exchanged between fishermen under certain circumstances, but property rights are not formally allocated to harvesters. On the whole, though, the formal allocation of property rights for specific areas and fisheries to particular people or communities is not widely used.

Whilst fishermen clearly initially felt that their proprietorship of the area was being undermined by the EMS designation, there is a growing realisation that many exploitation activities are compatible with the conservation objectives and that the economic and environmental sustainability of such activities is enhanced. Given this and their continued protection from incoming fishermen related to the regulating order under the shellfisheries recovery plan, the previous 'expropriation' concerns are subsiding as fishermen now appreciate that biodiversity and resource conservation objectives can be compatible if not synergistic and that the EMS designation does not mean that they can no longer exploit fisheries and have a role in related decision-making processes.

Ensuring that a sufficient degree of state funding is available to support the governance of the MPA, particularly in relation to enforcement and the economic incentives listed above, whilst ensuring that such funding does not allow the state to 'capture' MPA governance by unduly undermining the balance of power discussed below in relation to participation incentives

The EMS is reasonably well funded on a partnership basis between the relevant authorities, each contributing to the funds to employ an EMS project officer and to support the EMS governance structures/processes, as well as applying their sectoral enforcement responsibilities in a manner that supports the fulfilment of the conservation objectives. The local sea fisheries authority has sufficient funding to undertake its regulatory functions.

Of the five categories of incentives, economic incentives would appear to have been least applied.

Interpretative incentives

Using the media, champions and various interpretative approaches to overcome 'out of sight, out of mind' and alienation hurdles by raising the awareness of users, local people, relevant authority officers, politicians, etc about the aesthetic values and the ecological importance of marine biodiversity in terms of the species, habitats and 'landscapes' of the MPA

The NCA commissioned a market research company to explore how marine conservation might be effectively marketed amongst different societal groups. This research recommended that the emphasis should be on positive messages to promote an appreciation of our undersea landscape, including their habitats and the species they support, rather than negative messages about declines in marine fish stocks and biodiversity. They found that as people were relatively unfamiliar with marine landscapes, making them aware of problems such as overfishing and related losses of biodiversity would lead them to marginalise the marine environment in their field of concern, as they felt that there was nothing positive to engage with and that there was little they could do anyway. This led the NCA to take an innovative approach as part of their Marine Campaign, whereby the emphasis was on **'selling' our underwater landscapes through posters** such as that below for the region that includes the EMS, and by staging 'underwater flight' simulations through such landscapes at public events such as the Dive Show.

For more information about how to explore your local hidden undersea landscape, visit
www.naturalengland.org.uk/campaigns/marine

NATURAL ENGLAND

The EMS project has also placed considerable emphasis on awareness raising, commissioning a local artist to produce **various graphics and artwork that are employed in various media to promote the biodiversity values of the EMS** and generate support for this conservation initiative.

Promoting recognition of the potential resource benefits of the conserved areas in terms of spillover/export benefits for wider fisheries, insurance/resilience, local, etc, whilst being realistic about such potential benefits and not 'over-selling' them

The success of the shellfish recovery programme was promoted as having improved the sustainability of shellfisheries within the EMS.

Interpretative incentives have been widely applied to promote participation, cooperation and compliance with the EMS management scheme through awareness raising amongst users.

Knowledge incentives

Explicitly recognising the challenges raised by scientific uncertainty and the importance of developing approaches to help reduce and address such challenges, *eg* establishing ground rules for the interpretation and application of the precautionary principle, decision-making under uncertainty, and adaptation in the light of emerging knowledge

An *ad hoc* scientific advisory panel has been formed to support decision-making by collating and summarising the current state of knowledge on particular issues and identifying priorities for future research as a means of trying to both recognise and reduce uncertainty.

The sea fisheries authority instigated a long-term monitoring programme to assess the state of key shellfish stocks, particularly cockles and mussels, the results of which were directly fed back into shellfishery management policies as a basis for decisions concerning TACs, area closures, etc. This provided a **firm knowledge base for the shellfishery recovery plan**.

It is worth noting, however, that where the effects of harvesting on shellfish stocks were quite clear in terms of confidently establishing a cause-effect link, providing for the cause (over-harvesting) to be addressed, it was **not feasible to confidently establish a cause-effect link between the use of bird scarers and the potential effects** on bird and seal populations. Similarly, the cause(s) of declines in grey seal and other populations of listed species, including the effects of recreational activities like kite-boarding, remain(s) unclear, though research programmes are underway to increase certainty in such respects and to provide for more scientifically based decision-making processes. The **lack of long-term time series data** on the quality and distribution of habitats and the size of such populations exacerbate such challenges. Whilst the Wash is a relatively well researched estuary, uncertainty continues to be a challenge and the **importance of taking precautionary decisions** in the face of such uncertainty is recognised in the management plan and other EMS policies.

Promoting mutual respect amongst local people and scientists for the validity of each other's knowledge and expertise

Conflicts between 'local knowledge' and 'scientific knowledge' appears to be one of the **biggest causes of tension between local stakeholders and managers**, as the former claim that uncertainty could be reduced if local knowledge and expertise were more widely drawn on. There appears to be a perception amongst fishermen and other user groups that their knowledge of the area and experience is not taken seriously. In many cases this appeared to be the primary reason they were unwilling to engage with the EMS.

It would appear that whilst a partnership approach is being promoted for the governance of the EMS, there are still challenges to be addressed with regards to equally valuing and combining local and scientific knowledges. The statutory nature of this partnership, i.e. driven by the need to fulfill imposed obligations, has arguably led to a **greater emphasis being placed on 'scientific' knowledge than on local knowledge**.

Developing and supporting collective learning initiatives amongst local people and scientists through partnership research, specialist research and advisory groups, participative GIS etc. e.g. conducing studies on the patterns of biodiversity and resource use within MPAs, including trends

One of the reasons the three advisory groups was established was to promote the gathering of local knowledge on various aspects of the EMS. This is perceived by some users, however, as having been a 'one-way flow' whereby information is passed up to the management group and the scientists in the various

relevant authorities, but how and if this knowledge is actually combined with 'scientific' knowledge and applied to decisions remains unclear. Locals are sceptical about the commitment amongst agency scientists to collective learning and to actually using local knowledge in deliberations and decision-making.

This partly stems back to the basis on which the SAC and related SPA designations were originally selected and consulted upon, as they appeared to be a *fait accompli* based on expert knowledge. The boundaries of the SAC were largely drawn on the basis of having easily delineated boundaries for cartographic and navigational reasons, as detailed bathymetric and ecological survey data did not then exist. Particularly, discussion centred as to whether reefs in West Runton should be included in the designation. After some debate, these reefs were rejected from the SAC boundary but this strengthened the view amongst many locals that the 'experts' were lacking in their detailed understanding of the EMS and this fueled later frustration amongst some local users who feel that their **expertise based on local knowledge and long experience is discounted in EMS debates and decision-making processes, and that the potential for collective learning is thereby not being fulfilled**.

Employing arbitration panels to reach judgements on decisions where uncertainty is a significant issue

The public inquiry took evidence from both agency scientists and from locals and one of its roles was to arbitrate on the question of whether bird scarers should be allowed in the face of uncertainty and contrasting arguments based on expert and local knowledge. It is interesting to note that both parties constructed contrasting arguments concerning the application of the ecosystem approach and the precautionary principle, the mussel layers' arguments favouring the continuation of their activities. The key ways in which these arguments contrasted were in their interpretation of these concepts and in the knowledges on which the arguments were based.

Both sides conceded that the reliability and validity of a significant proportion of the scientific information presented was questionable. However, they interpreted the data very differently and called for the precautionary principle to be invoked for conflicting reasons. The mussel cultivators argued that the wider ecological impact of abandoning the mussel lays was unclear as they had been in position for over 100 years and had become an essential feature of the ecosystem. Therefore, the scaring of the eider ducks, which they claimed would not significantly affect the integrity of the ecosystem of the Wash, was necessary to ensure the continuation of mussel farming, as an activity which had become integral to the Wash's ecosystem. The NCA claimed that there was little evidence to support the argument that the artificial lays had an important ecological function and that not enough was known about the wider ecological impacts of the scarers. Consequently, they argued that the wailers should not be permitted, as they claimed that they would have significant impacts not only on the eider duck population, but also on other bird species and seals that are important components of the Wash's ecosystem, as well as being legally recognised features of the EMS.

Both the mussel layers and English Nature supported their case with differing interpretations of the role of mussel farming in the Wash ecosystem, the former arguing that mussel lays had become an essential element of the Wash's ecosystem, the latter arguing that the introduction of measures to reduce eider predation on mussel lays represented a threat to the integrity of the Wash's ecosystem.

This also raises an important question regarding the interpretation and implementation of the precautionary principle. However, it does not help when it is unclear which of a number of activities may or may not cause damage to ecosystems and whether such damage might be significant, especially given the challenges of establishing cause-effect relationships in marine ecosystems. This is clearly the case with both the claimed impacts of scarers on bird and seal populations and, to a lesser degree, the claimed role of mussel lays in the estuary ecosystem.

Furthermore, the problem is significantly magnified when there is a conflict between unproven scientific evidence and local knowledge developed over many years. This conflict was exacerbated in the Wash case by the RSPB (bird conservation NGO), who were giving evidence in support of the NCA's case at the public inquiry. They claimed that in cases such as this, **local knowledge was irrelevant and the decision should be based purely on objective information presented by 'experts'**. For example, fishermen argued that eider duck numbers were increasing as a result of displacement from the Wadden Sea (other side of the North Sea) due to overfishing related food shortages there. The RSPB rejected this argument at the inquiry in order to support the case against the mussel layers, but they later accepted this argument, much to the frustration of fishermen, who appreciated that local knowledge had been selectively denied for

strategic reasons and that the benefit of the doubt had been given to the RSPB. Similarly, the RSPB rejected fishermen's arguments at the inquiry that mussel lays had sustained bird populations during winters when the wild stocks were depleted due to over-fishing in the 1990's, though this was quite widely accepted and would have supported arguments that the lays had become an element of the estuary's ecosystem.

Where scientific evidence and local knowledge are at odds, the final decision is often left to civil servants and politicians who are unlikely to have any significant scientific training or local knowledge. Whilst one of the challenges of public inquiry was to arbitrate on these contrasting arguments, the official 'top-down' nature of the inquiry was arguably one of the key reasons it found in favour of the NCA as it placed a greater emphasis on the 'scientific' knowledge they presented and the legal rationale behind their case. It is thus **questionable whether the public inquiry was 'independent' with regards to arbitration in the face of uncertainty and contrasting arguments based on local and scientific knowledges**. It is likely that the inquiry will have exacerbated the concerns of many locals that their knowledge is not respected in deliberations and decisions related to the EMS, but a judgement in the face of uncertainty and 'contrasting knowledges' was at least reached which provided for events and discussions to move forward.

Employing independent expertise where agreement cannot be reached locally

This is similar to the arbitration panels but more direct, in that experts that are trusted and respected by all parties are commissioned to undertake research to address specific questions. There were two examples of this incentive being employed. The fisheries authority's assessment of mussel stocks on the Gatt mudflat was disputed but the assessment of an independent expert trusted by both parties was accepted, though it was the same as the fisheries authority's. This also increased the trust that fishermen had in the fisheries authority's stock assessments which will support similar future processes.

In relation to estimates of the total supply of shellfish that was needed by wild bird populations, there had been many discussions on this but no rigorous assessments, even though this is a critical issue. A research laboratory the **expertise of which was respected by most parties** was commissioned to assess the total dietary requirements for shellfish by the various species of birds that feed on bivalves within the EMS. The figure they estimated was only a small proportion of the total bivalve productivity of the site. This key information provided for many debates and initiatives to move forward, as it was accepted by the nature conservation authority, fisheries authority and the fishermen. This figure indicated that the shellfisheries could support both the fishing industry and the wild bird populations, further reinforcing the view that the site could achieve both fisheries exploitation and biodiversity/resource conservation objectives. Furthermore, it provided for informed discussions as to which stocks should have restricted exploitation to maximise the profitability of harvesting, as mussels had a much lower commercial value than cockles.

Conflicts between 'local' knowledge and 'scientific' knowledge appear to be one of the biggest causes of tension between local stakeholders and managers, but reliance primarily on 'scientific knowledge is arguably appropriate given the top-down and science-driven nature of the EMS legal framework. Employing independent and more widely trusted experts seems to be a key means of overcoming this conflict.

Legal incentives

One of the key features of this case is that it has a very specific legal framework through the Habitats and Birds Directives and the UK Regulations that implement them.

Having a clear and consistent legal framework with specific conservation objectives and clear roles in relation to enforcement responsibilities, etc for different authorities

All relevant authorities have a clear role in that they are legally obliged by the regulations to exercise their functions and powers in a manner the secures compliance with the European Directives. These obligations are clarified in great detail in the various official documents for this designation, *eg* the regulation 33 advice, management plan & action plan.

Employing legal adjudication and other formal and widely respected decision-making platforms to address and regulate conflicts

Whilst a public inquiry is not a judicial court, they do have the legal mandate to take evidence from various parties in relation to planning conflicts and to make a recommendation to the government and they are open and transparent. They are a widely utilised and respected adjudication platform for planning matters, but the decision is ultimately made by the government.

Adopting a sensitive but decisive approach to legal interventions to address basic conflicts that would otherwise undermine the fulfilment of marine biodiversity conservation objectives

The inquiry's report and the government decision were also explicit in recognising the role of the EC Habitats Directive in this decision. As such this was a **clear and top-down driven intervention** that provided for policies and operations to move forward in the light of it, and avoided biodiversity conservation objectives being undermined.

Ensuring sufficient national-local state capacity, political will, surveillance technologies and economic resources are available to ensure enforcement of all restrictions on all local and incoming users, including addressing the **drivers** of incompatible trends in exploitation activities

In this case, as in many cases, it was **neither feasible nor appropriate to address the forces driving** the expansion of mussel farming. The **tendency to address the impacts of activities driven by such forces rather than addressing the forces themselves,** with apparent success, is arguably attributable to a number of factors:-

- Authorities being provided by the state with sufficient capacity and resources to address the impacts;
- The relatively minor nature of these driving forces;
- Market forces amongst EU countries are an accepted and integral aspect of the UK's membership of the European Commission;
- Ecological forces related to complex natural dynamics with which high degrees of uncertainty are associated cannot realistically be addressed.

In order to increase enforcement capacity, there is an initiative to install VMS systems on all fishing vessels operating in and around the EMS. At present only boats >14 m in length are required to have VMS, but funds have been applied for from the EC to install it to the 50 boats <14m. The fishermen are supportive of this initiative, as it will ensure that all comply with the restrictions whilst also giving accurate data to support arguments that certain areas are not affected by fishing and allowing boundaries to be drawn more tightly round conservation features, rather than having a wider buffer zone to accommodate uncertainty over a vessels precise position. This reveals a willingness to embrace new enforcement technologies if they provide for equal enforcement on all fishermen and firm evidence for the actual distribution of fishing effort in relation to conservation features. It will also fulfil the need to strengthen the enforcement capacity of the nature conservation authorities, as highlighted by the magistrate in a recent unsuccessful case to prosecute fishermen for harvesting cockles in a closed area.

Promoting clarity and openness concerning the jurisdictional boundaries of the MPA legislation, *ie* recognising what driving forces, activities and impacts cannot be directly addressed by the MPA legislative framework and exploring means of addressing such factors

The proposals for wind farms near the boundaries of the EMS have been a cause of some heated discussions at advisory and management group meetings. The potential effects of these renewable energy developments on the EMS, particularly on bird populations that could be impacted on their passage into and out of the site, has to be considered under the legislation as a plan or project outside the boundaries but with potential to impact the designation. However, beyond this the designation does not confer any additional protection from such proposals. Both fishermen and conservationists are very concerned and some meetings have been dominated by discussions about the impacts, and whilst every effort has been made to clarify that the EMS designation has no direct say over whether the wind farm proposals were approved, this does not appear to have allayed frustrations that this conservation designation does not

provide for such proposals to be strongly resisted, other than through assessing whether they will have any 'down stream' effects and whether these effects will be significant. Wind turbines have been developed near the boundaries of the EMS and further developments are proposed, so the emphasis continues to be on stressing that the EMS management group has no direct jurisdiction where these proposals are concerned and on trying to overcome any frustrations that this can lead to through a the building of a resilient partnership. More could perhaps be done by the NCA to communicate that they are actively engaged in requiring 'appropriate assessments' from proposed wind farm developers, objecting to proposals, placing conditions on developments, etc, as this could allay some of the concerns that the designation is 'powerless' in the face of wind farm proposals near the site.

Ensuring effective coordination between state and local authorities, and between conservation and other government agencies/law enforcement units, when joint efforts are needed to deal with complicated, cross-jurisdictional and cross-sector conflicts

The cross-sectoral obligations and coordinating role of the management group appear to provide for this.

Establishing legal provisions to ensure the transparency in MPA management processes, *eg* statutory requirements for public access to information, appeals, public hearings, etc.

The mussel farmers exercised their right to appeal against the NCAs refusal to license the use of bird scarers; the resulting public inquiry was transparent and the government's justification for its decision to uphold the ban on using bird scares was detailed and justified in a clear manner.

Legal incentives would appear to have been the key drivers of the W&NNC EMS and the key incentives to address conflicts between conservation and exploitation.

Participative incentives

Promoting consistency with and respect for local traditions, customs, norms and practices, in so far as they are compatible with the fulfilment of marine biodiversity conservation obligations

One of the elements of the UK policy on EMSs and of the W&NNC EMS Management Plan is that existing activities, including traditional, customary practices, should continue provided they are compatible with the conservation objectives for the designation in question. Mussel farmers argued at the public inquiry that their activities represent a traditional practice that has become an integral element of the estuary's ecosystem, and that they should be supported on this basis, in keeping with the 'humans-in' view of the ecosystem approach. The NCA, however, argued that whilst small-scale, low technology mussel farming may represent a traditional, customary activity, large-scale mussel farming supplying markets all over Europe and utilising modern technologies did not. Even if the mussel farming operations in question were accepted as a traditional activity, their intensification would not be allowed to undermine EMS conservation obligations under the Habitats Directive unless they were judged to represent 'imperative reason of over-riding public interest' (IROPI), for which there is no precedent with respect to allowing the objective of conserving 'traditional' activities to override biodiversity conservation objectives. This incentive is therefore applied but is subject to three key tests - Is the activity really traditional? – If it is, is it consistent with the conservation objectives? If it is not, does it represent an IROPI?

The Gat case is significant in this respect as the NCA proposed closing the shellfishery on these flats completely but then agreed to a proposal to allow hand-gathering, the fishermen actually proposing a TAC below that suggested by the fisheries agency as this fulfilled their local market requirements whilst providing for the continuation of a traditional fishing method that was compatible with the biodiversity conservation objectives.

Promoting equity amongst users through fairly distributing the costs and benefits of decisions and recognising the importance of social and environmental justice issues

The mussel farmers were not compensated for any losses through eider duck predation on their stocks incurred through the state's refusal to allow them to employ bird scarers, as the regulations do not provide

for this. It is also the government's implicit policy not to compensate fisheries exploiters for restrictions imposed by the state to conserve what is recognised as a public resource (Jones 2009). Any concerns about inequities resulting from this lack of compensation appear to gave been overcome by the scale and profitability of the particular mussel farming operations coupled with the mitigating factors discussed above (improved catches, higher prices, etc). Research related to MPAs in SW England, however, indicates that many fishermen consider that the fact they are not compensated for losses they incur through MPA related fishing restrictions represents a social injustice (Jones 2009).

Providing for a degree of local protectionism from incoming users, recognising that exploitation by incoming users often poses a major threat to local biodiversity and resources

These inshore fisheries (< 6nm) are not subject to the geopolitical complexities of shared access amongst EU member states of the European Commission's Common Fisheries Policy, so protection against incoming fishers from other EU countries is not an issue. It is legally feasible for UK registered fishers from outside the area to secure a licence from the local fisheries authority to fish within the area, and some vessels are registered at fishing ports outside the area, but the local fisheries authority has gained a Regulating Order for the Wash which provides them with the powers to restrict access to the Wash to a certain number of licensed vessels, so fishers within the area have protection from incoming fishers, though this protection has not, in this case, been conferred by the MPA designation.

Promoting pride in the designation and the biodiversity and sustainable uses that it supports, respect for the related decisions and thereby the potential for cooperation and peer enforcement

The management group meeting of the Wash & NNC EMS after the official recognition that the shellfish beds had gone from 'unfavourable declining' to unfavourable recovering' condition was promoted as a celebration of this recovery, and advisory group members were invited to this. The publicity materials for the EMS are designed to promote awareness of and pride in the W&NNC, including the recognition of its value conferred through the European Designation.

Building trust (social capital) in the people running and involved in the MPA and amongst users through transparency, face-to-face discussions, equity promotion, etc, recognising that this can lead to an 'upward spiral' (Ostrom 1999) of cooperation and confidence that cooperation will be reciprocated amongst MPA users, whilst erosion of trust through lack of transparency, equity, enforcement, etc can lead to a 'downward spiral'

The initial emphasis of the first EMS project officer on personally meeting representatives of relevant authorities and of various user groups (including attending and giving presentations at user group meetings and generally 'mixing' with local users) is consistent with arguments that such face-to-face meetings are a key means of generating social capital (trust, mutual respect, confidence, etc). If people first learn of a proposed designation through an official letter, this can increase the potential for apathy and objections, and this had created a challenge for the EMS project officer as this was what the SAC designation consultation amounted to. Her efforts to recover the situation by generating social capital through face-to-face meetings, attending user group meetings, etc after the designation had been approved was considered to have contributed to increasing the potential for the participation and cooperation of users and relevant authorities. The second and current project officer has also placed much emphasis on personally meeting and interacting with local users and relevant authority representatives as a means of developing further social capital.

Given the historical lack of a role for the NCA due to the lack of designations that affected marine activities, many users of the site were very suspicious of the nature conservation officers and the role of their agency. Trust in the conservation officers is developing as is trust in the second project officer, who has now been in post for seven years and is employed by the EMS partnership, rather than the NCA. This relatively neutral role is one of the factors that has led users to trust him a great deal more and act as a mediator.

Strategically developing and strengthening linkages amongst relevant state authorities and key user groups, including mutual trust, in order to promote the fulfilment of biodiversity conservation obligations and build

resilient governance structures

The focus discussed above was and is not necessarily strategically focused on identifying key people and having face-to-face meetings solely as a basis for strengthening the governance framework, but in effect this is what has been achieved. The **personal links that have been established between the project officer and key representatives of local users and relevant authorities appear to have been a factor behind the partnership being resilient enough to withstand the tensions as a result of the public inquiry**. Personal links have also been established and strengthened amongst relevant authority and user representatives, which have also contributed to the resilience of the partnership. Though the strength of such links and their contribution to improving the resilience of the partnership, *ie* bracing social capital, is too intangible to objectively measure, the view gained through interviews with people involved in the W&NNC EMS partnership is that such linkages have been important in developing and strengthening the partnership.

One example of this is provided by the issue discussed above concerning the wildfowlers, who felt alienated from the Wash Estuary Strategy Group that preceded the EMS. There was a risk that this alienation would be perpetuated through the EMS when wildfowlers objected to a draft research plan that appeared to highlight the need to focus on reducing the impacts of wildfowling. Even though the plan was only a draft, the fact that it was bound and appeared to be a final document fuelled the objections. The RSPB warden had good links with the wildfowlers and was trusted by them, and he stated that he trusted the EMS project officer, and that if the wildfowlers trusted him, they should trust her by extension. This was successful in allaying the fears of the wildfowlers that their activities were again being singled out for regulation, and they have become actively and constructively involved in the EMS.

It is also worth noting, in this respect, that the chair of the EMS management group is the chief fishery officer of the local sea fisheries authority. This has helped a great deal in strengthening the partnership, particularly of building constructive links with local fishermen, and appears to have been a key factor in making the partnership resilient enough to withstand the tensions as a result of the public inquiry. The chief fishery officer being willing to chair the EMS as a result of the positive linkages established with fisheries officers and fishermen has been a key factor in the success of the partnership, especially considering that in other EMS cases, one of the more reluctant relevant authorities has been the local sea fisheries authority.

Delegating some roles, responsibilities and powers to local people through a clear management structure, whilst maintaining an appropriate balance of power between local people and the state in relation to the legal biodiversity conservation obligations. Managing expectations in this respect can be particularly important by being realistic about the degree of autonomy that local people can expect

This is an important role for the advisory groups as various tasks, are delegated to them, such as addressing questions on certain issues and providing local user information in relation to certain issues. They are also encouraged to develop EMS management ideas/proposals for consideration by the management group, and are consulted on ideas/proposals developed by the management group. However, even though the advisory group chairs sit on the management group, the top-down nature of this 'statutory partnership' means that responsibilities and powers related to the EMS can never be *entirely* delegated/devolved to the advisory groups. This is made clear through the agreement that specifies the roles of the advisory groups.

An example of the challenges of delegating roles to advisory groups is provided by the process by which the Regulation 33 advice (detailed conservation objectives and advice on operations likely to undermine them) was developed. The management group delegated certain elements of this to the advisory groups. However, the legally binding nature of this advice led the conservation authority to instruct all EMSs to suspend this process for over a year until an officially approved approach and framework had been agreed, in order to ensure national consistency and legal defensibility. This meant that the management group had to, in turn, instruct the advisory groups to suspend their activities and discussions towards developing this advice, or accept that any advice that they developed might have to be revised in the light of the statutory framework for such advice imposed by the national nature conservation authority. This contributed to the apathy and feelings of disempowerment felt not only be users on the advisory group, but also be some representatives of relevant authorities on the management group. This was a problem for many EMSs at this time (Jones and Burgess 2005).

Employing approaches that support participative planning and decision-making, e.g. participative GIS, postal consultations on proposals that provide for detailed constructive feedback, participative planning workshops, etc

Whilst developing personal linkages with key people has been a factor behind the success of this partnership, it is not feasible to achieve this with all direct and indirect users of the EMS through the advisory groups. Whilst such groups can provide for the face-to-face participation of representatives of all key user groups, more remote forms of participation need to be employed to provide for the input of the wider user community. In this case, postal consultations are employed to gain detailed feedback and suggestions on EMS governance proposals. Postal consultations have also been an important means of raising awareness amongst the wider user community. A key factor behind this is that such proposals have already been discussed by the advisory groups, which include representatives of most key user groups, so this appears to have contributed towards developing proposals that consider different perspectives amongst different users. The confidence that many users have that their perspective is actually represented on the advisory group through their representatives appears to be reasonably high. Whilst objections to and critical questions about proposals consulted upon by post are still forthcoming, they are taken into account in the deliberations and decisions of the management group. It is not feasible to provide for the more substantive and personal participation of the many hundreds, if not thousands, of users who have a stake in the governance of the W&NNC EMS so the balance between the participation of users on the advisory and management group, who represent their constituents through there own networks, coupled with the wider postal consultation exercises, appears to be an appropriate one.

The Gat case discussed above also reveals that wider participations that involve all users who are potentially affected by a proposal can be more equitable and effective than consultations through existing but restricted networks such as fishermen's associations. Extending participation in the consultation to hand gatherers provided for a decision to have a lower TAC, half that originally proposed, that would provide economic benefits to a larger number of people whilst also maintaining a small-scale industry. It also provided for a small no-take area within the Gat mudflats. This was a better outcome than the conservation agencies original proposal to designate the entire Gats a no-take area, which would have likely led to an illegal and unregulated fishery by hand gatherers that fulfilled neither fisheries not nature conservation objectives.

A current initiative to protect certain biogenic reefs within the EMS is further reinforcing the view that the

participation of fishermen can minimise the impacts of restrictions to achieve biodiversity conservation objectives whilst the conservation authority are increasingly realising that this also provides for such objectives to be fulfilled. In this ongoing case, negotiations in the light of better information on the distribution of the reefs and the prospect of VMS on all vessels has provided for an area of less than 10% of that originally proposed by the nature conservation authority to be protected through closure to shellfishing, *ie* targeting not compromise through information sharing and negotiation.

The incentive of participative decision-making is therefore considered to be successfully applied in an appropriately balanced manner, *ie* which provide for the conservation obligations to be fulfilled. Whilst these obligations were originally viewed by many users as an unwelcome imposition, many are now accepting them, provided they are implemented through open negotiations in a participative and 'least impact' manner, whilst conservationists are now accepting that this approach can be followed without compromising conservation objectives, both accepting that this would lead to a mutually unwelcome statutory intervention.

Promoting transparency concerning how stakeholder participation has affected decisions and why it may or may not have done

User representatives who participate in management &/or advisory group meetings witness how their input has or has not affected decisions and are at least aware that these meetings have provided for their perspective to be discussed. The majority of users participate through postal consultation exercises concerning specific proposals and all the consultation responses are summarised along with an explanation of the basis of the final decision by the relevant authority. Whilst this may not satisfy all respondents in terms of the outcome, it is a transparent process.

Promoting recognition and realisation of the potential for a given MPA to influence the higher-wider statutory framework, processes and obligations, *ie* co-evolution of institutions

Whilst there is considerable emphasis on explaining to users that decisions must be taken in a manner that promotes compliance with the higher-wider statutory framework related to the Habitats Directives, the potential to influence the revision of this framework has not arisen or been proposed. It is worth noting that the W&NNC EMS is being promoted as an example of good practice in governing such designations at a UK and EU level. This is a source of pride for many involved RAs and users and could help support the wider development of participative EMS governance approaches that provide for the combined fulfilment of biodiversity conservation and sustainable exploitation objectives.

Bringing in 'neutral' facilitators to support governance processes and negotiations or training state employees to facilitate and support

The chairs of advisory groups and management groups function as facilitators and whilst they may not be formally recognised or trained as facilitators and arguably are not 'neutral', there approach to chairing meetings and facilitating meetings appears to have been successful in that there have been no calls or recognised needs for bringing in 'neutral facilitators'.

Employing 'neutral' and widely respected panels to arbitrate on issues and recommend decisions

It is debatable whether the public inquiry represented a 'neutral and widely respected panel' but it did take evidence from all sides and arbitrate by reaching a final decision.

Being very clear and honest, once decisions are made, about the potential benefits and costs, as well as the restrictions imposed on certain users

Any decisions that lead to user restrictions, be these through regulations or voluntary codes of practice, are clearly disseminated and publicised through the 'good practice guide, statutory notices, etc. Any regulatory restrictions have to be subject to a formal 'impact assessment' as part of the legal consultation process, and this assessment includes the costs and benefits of the proposed restrictions in terms of the impacts on public and private sectors, and is circulated as part of the legal consultation process

Participative incentives have arguably been designed and applied in an instrumental manner, driven by the legal framework, *ie* what Jones & Burgess (2005) describe as 'tempered facilitation', but also in a manner that has provided for the influence of fishermen and other users, and thereby promoted mutually acceptable decisions and cooperation.

CROSS CUTTING ISSUES/FACTORS

Leadership

This was a critical positive factor that was demonstrated at all levels:-

- The Habitats and Birds Directives and the related obligations and enforcement capacity afforded by the European Commission gave strong legal leadership – strong federal lead;
- The UK government, which is considered by some to 'gold-plate' European Directives, transposed these obligations and provided strong enforcement capacity, due largely to their obligations as part of the European Union – strong state lead driven by above;
- The local sea fisheries authority demonstrated a commitment to implementing the designation for both fisheries and biodiversity conservation objectives, where fisheries authorities for other EMSs in the UK have refused to take on and fulfil these obligations;
- Effective coordinating and bridge-building role of the EMS project officers.

Leadership has been critical to the success of this MPA, arguably ultimately related to and supported by the obligations under the Habitats and Birds Directives.

Role of NGOs

The Royal Society for the Protection of Birds (RSPB) has been a key ally of the NCA, providing considerable support at the public inquiry and in various other ways, including support for the EMS project officer in developing positive links with users such as wildfowlers. Some fishermen, however, resent the interference of this NGO, particularly in undermining the validity of local knowledge and support for the fishermen.

Equity

Though fishermen consider that a lack of financial compensation for fishing restrictions represents a social injustice, there are alternative livelihoods within and beyond the fishing industry and a social welfare system that provides a 'safety net'. Whilst equity issues are raised by this case, they are not to the same degree and extent as equity issues in less economically developed countries where there is a more critical reliance on harvesting marine resources for subsistence and livelihood.

Stewardship

The designation of this site as subject to biodiversity obligations to the EC has undermined many direct users' sense of ownership of the area. There is, however, a growing acceptance among many extractive users that compatible economic development opportunities are provided for through the EMS governance approaches. It must also be stressed in this respect that the fisheries were always a public resource to which the fishermen were a granted access rather than proprietorship. The biodiversity conservation obligations continue to lead to restrictions on the activities of some fishermen, over and above those that would be imposed purely for fisheries conservation objectives, and these continue to undermine their sense of proprietorship, though some fishermen feel that they now have a more responsible role as stewards on behalf of future generations of fishermen. The restriction of access rights to certain fishermen that the designation reinforces, however, has reinforced the proprietorship of many fishermen. Many non-extractive users e.g. recreation, wildlife appreciation, tourism, have had their pride in and proprietorship towards the EMS strengthened by this designation. Overall, the emphasis on participation as a means to deliver obligations has assisted in minimising the potentially undermining effects on proprietorship of this imposed designation.

National Marine Sanctuary System, USA
Governance Analysis

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The opinions expressed in this case study are those of the author and do not represent the views of the Office of National Marine Sanctuaries, NOAA, or the U.S. government.

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1. CONTEXT

Name of MPA: National Marine Sanctuary System (NMSS)
Size of MPA: 407,740 km^2 among 14 MPAs (see Table 1)
Coastline length (where applicable): varies with each site
Distance from shore: varies with each site (coastal, nearshore, and offshore sites)

Population per km^2: 0.032 person/km
Population growth rate: 0.975%
Per capita GDP: $US 47,000
GDP growth rate: 1.3%.
GDP composition by sector: agriculture (1.2%); industry (19.6%); and services (79.2%)
Labor force by occupation: farming, forestry, and fishing (0.6%); manufacturing, extraction, transportation, and crafts (22.6%); managerial, professional, and technical (35.5%); sales and office (24.8%); and other services (16.5%).
Unemployment rate: 10.2%
Government type: constitution-based federal republic

The gateway communities for the sites range from small towns to some of the largest urban areas and working ports in the US (e.g., Seattle, Boston, and San Francisco). In the smaller towns, much of the local economy is dependent upon coastal and marine resources, and includes such uses as fishing, marine recreation such as diving and boating, and tourism. Some of the sites also occur adjacent to or near communities with high concentrations of native peoples, including Native Americans, Native Hawaiians, and Samoans. Many of the NMSS sites are also adjacent to or near federal, state, and locally managed terrestrial and marine protected areas.

2. OBJECTIVES

The primary mandate for national marine sanctuaries, as designated under the National Marine Sanctuaries Act (NMSA), is resource protection. The NMSA also provides an additional nine subsidiary purposes and policies.

3. DRIVERS/CONFLICTS

Uses occurring in and near, and affecting, NMSS sites include all uses of coastal and marine resources, including commercial and recreational fishing; other recreational uses including diving and boating; other resource extraction such as oil and gas (in a limited fashion in some sites); shipping; aquaculture; alternative energy; and research, among others. The occurrence and impacts of such activities vary from sanctuary to sanctuary. Like other MPAs, the 14 sites also face global scale issues (i.e., climate change) and natural disasters (e.g., hurricanes and tsunamis).

4. GOVERNANCE FRAMEWORK/APPROACH

NOAA's Office of National Marine Sanctuaries (ONMS) has the chief responsibility for managing

sanctuaries. For those sites that include state or territorial waters, there are also formal or informal co-management arrangements (i.e., the management of the site is overseen by both the ONMS and a state or territorial partner) with the appropriate state or territory (Michigan, Florida, Hawaii, and American Samoa). The Olympic Coast sanctuary in Washington also has shared jurisdiction with four Native American tribes recognized by treaty as sovereign governments. The monument has a tripartite management structure, shared among NOAA, the U.S. Fish and Wildlife Service, and the State of Hawaii.

The NMSA gives ONMS the authority to manage many activities within a sanctuary (as well as the authority to work with other agencies holding jurisdiction over activities, such as the Federal Aviation Authority to regulate overflights in sanctuaries). However, other factors impact the use of such authority, including state laws and gubernatorial "opt-out" rights (i.e., a sanctuary regulation may not take effect in State waters if a governor decides such a regulation is unacceptable); other federal laws; indigenous uses, traditions, and laws; long-standing community uses; and politics.

ONMS works with a complicated array of other federal, state, local, and tribal agencies who either share jurisdiction or hold authority for areas adjacent to a sanctuary. Relationships with these partners include:

- fully formal co-management arrangements spelled out in detailed written agreements (e.g., Florida Keys, Hawaiian Island Humpback Whale, Papahanaumokuakea)
- government to government consultation (e.g., the Intergovernmental Policy Council for the Olympic Coast includes representatives from the four treaty tribes, the State of Washington, and NOAA)
- agency coordination mechanisms (many sites)
- representation on sanctuary advisory councils (all sites)
- consultative roles on permits (all sites)
- casual project-based relationships (all sites)

While ONMS has some authority to regulate activities outside sanctuary boundaries (specifically those that have the potential to enter a sanctuary and injure sanctuary resources, such as discharges), ONMS normally must rely on partner agencies to help protect sanctuary resources from impacts from such outside activities as agricultural runoff and coastal development. For example, Monterey Bay and Florida Keys have extensive water quality protection programs involving many partners to help protect the water quality of the sanctuary.

Each site in the NMSS has its own management plan, which contains boundaries, regulations, and programs that are individually tailored to the resources and issues facing each site. The management plan also outlines the policy goals and objectives for each site, including those for individual program and/or issue areas. The goals and objectives contained in management plans are arrived at using a collaborative process that includes management partners and sanctuary advisory councils (community-based advisory groups chartered for each site). This process is labor and time-intensive, in order to achieve full public engagement. It is thus very effective in that it is inclusive of all sectors of a sanctuary community and helps build support and buy-in for a management plan.

5. EFFECTIVENESS

As a system, the NMSS is consistently challenged on how to manage 14 disparate sites as a system while recognizing that there are unique and important differences among those sites that impact how effectively each is managed, or governed. In general, this challenge is approached by providing a system-wide framework, process, or set of guidelines, which is applied by each site, adapting it to its own local needs and resources. The NMSS manages sanctuaries using a number of instruments or mechanisms, including regulations; permitting (a national framework guides individual site decisions); policy development (developed at the system level, with flexibility for site needs); sanctuary advisory councils; enforcement; zoning; and other programs.

There are currently no system-wide regulations for the NMSS. Regulations are therefore individually

tailored to each sanctuary. During the designation of a sanctuary, and at periodic intervals after designation, an assessment is made of the uses of that particular area to determine if they are compatible with the primary purpose of sanctuaries: resource protection. If a use is found to be incompatible, it will be restricted in some fashion through sanctuary regulations, which include outright bans on some activities; prohibitions with some permits allowed; and time and/or area restrictions through zoning.

Effectiveness of sanctuary management and protection efforts is measured by a series of site-level and system-level performance indicators. Site level indicators are developed and monitored by each site. There are seven primary system-level performance indicators. The ONMS uses condition reports to help assess effectiveness of the sites, including for these seven and other secondary performance measures. Condition reports document the condition of sanctuary resources based on sanctuary staff judgments after consultation with selected partners and best available information. The reports serve as a tool to determine if the sanctuaries are achieving their resource protection and improvement goals as reflected in ONMS performance measures. Specifically, condition reports include information on the status and trends of water quality, habitat, living resources and maritime archaeological resources and the human activities that affect them.

The latest assessment (2008) of the primary seven measures showed the NMSS was on track to meet five of them but had fallen behind on two measures. The decrease in performance on the latter two is attributed to a more rigorous assessment of sanctuary resources conducted during the preparation of site condition reports, rather than a measurable decline in resource quality from the prior year. The issues of concern also tend to result from external factors over which individual sites have limited control, including invasive species and habitat loss.

Based on this assessment, the NMSS is at a scale of 4, most impacts addressed but some not completely. Fishing impacts continue to be of concern at individual sites, as well as emerging uses such as alternative energy. Effectiveness of these sites is judged to be stable, and is expected to increase as newly created protections in various sites (such as re-routing of vessels in Stellwagen Bank and the marine reserve network in Channel Islands) come into effect and/or mature.

6. INCENTIVES

The system-wide culture of the ONMS encourages the use of both proven and innovative incentives to help protect sanctuary resources. Some have worked well across the entire system, despite differences among sites but in other cases, different techniques have worked better in different sites. Participative, legal, interpretive, and knowledge incentives have been the most important and effective for the NMSS.

Participative incentives (e.g., sanctuary advisory councils, volunteer programs, public meetings) are seen by the NMSS as most important in building a sense of stewardship in the sanctuary community and providing real involvement for local citizens in decision-making processes. Legal incentives (e.g., site specific regulations and enforcement programs, management arrangements with co-jurisdictional partners) are also an important element for NMSS effectiveness. Interpretive incentives (ranging from traditional, curricula-based education efforts to innovative web-based, real-time “telepresence” efforts) are not only among the NMSS’s primary purposes, but represent a significant investment of staff time, funding, and resources. Providing accurate and up-to-date information to the community and user groups, including through advisory councils, is crucial in the success of designation and management plan review processes. Knowledge incentives (e.g, maximizing and integrating data and information coming from multiple sources, using sanctuary advisory councils as independent information and advisory sources) are also a priority for the ONMS.

Economic incentives are less utilized by the ONMS than the other four types of incentives (for reasons discussed below under **Key Issues**) but focus mainly on demonstrating the potential economic value a sanctuary may bring to a local economy.

These incentives are supported, and made that much more effective, by a strong local presence and strong, stable leadership (for example, permanent onsite manager and staff; office, visitor center, and support

facilities; at least one vessel (owned or accessible); an advisory council; and a management plan, regulations, and programs tailored to the needs and resources of the site). The NMSS's position has always been that communities adjacent to the sites must feel a sense of ownership and stewardship for their sanctuary, or it will not be successful. In at least two cases (Thunder Bay and Florida Keys), there was a strong and openly antagonistic attitude in the community toward the sanctuary; for example, in both sites, local referenda asking about support for a sanctuary showed a majority of the community did not support the designation. In both cases, however, transparency and community involvement in decision-making, diligence in building relationships, presentation of clear and unbiased information, and simple persistence have changed community attitudes into strong support for their sanctuaries.

7. KEY ISSUES

The main issue associated with participative, interpretive, and knowledge incentives is sustaining and enhancing such high-cost incentives in tight fiscal times.

For legal incentives, the primary challenge is enforcement of site regulations. Enforcement resides with NOAA's Office for Law Enforcement (OLE), and through cooperative arrangements with the U.S. Coast Guard and, in some instances, state park and wildlife agencies, mainly on a voluntary basis based on shared jurisdictions. Enforcement programs in the sites are in various stages of development. Most sites have not yet invested significantly in enforcement due to lack of available resources; system-wide there is an extremely limited capability. Chief factors that have hindered development of the ONMS enforcement program include a lack of resources and competing management priorities, expense of enforcement, remoteness and size of sites, differences in regulations between sites, and the complicated nature of state/federal enforcement relationships.

Regarding a more extensive use of economic incentives, although the ONMS has a generic authority under the NMSA "to create models of, and incentives for, ways to conserve and manage these areas, including the application of innovative management techniques," the ONMS lacks resources to facilitate the development of alternative livelihood and economic development projects, one important economic incentive. Such programs would contribute to greater acceptance of sanctuaries during the designation process and to easing the socioeconomic impacts, if any, of regulations.

One kind of knowledge incentive, adaptive management, could be put to better use in protecting sanctuary resources, but has for numerous reasons not been utilized as heavily as it might. Adaptive management has been integrated into sanctuary management where possible, including:

- five-year reviews of management plans and regulations;
- authority to tailor permits to specific situations on a case-by-case basis, including revoking them under certain circumstances;
- consultation requirements (i.e., in general, federal agencies are required to consult with the ONMS if any of their proposed activities may have an impact on sanctuary resources);
- authority to issue emergency regulations in certain circumstances;
- real-time feedback and advice from sanctuary advisory councils;
- zone monitoring programs; and
- management effectiveness programs and condition reports.

However, lack of an explicit authority for the precautionary approach has impeded the full protective benefits that such an approach would realize for the NMSS.

Name of Site	Total Area (mi^2/km^2)	Year Designated	Description	Coastal or Offshore?	Includes State Waters/ Territorial Seas?
Cordell Bank	529/1,369	1989	Deep, productive offshore bank off CA	Offshore	N/Y
Channel Islands	1,474/3,818	1980	Productive waters around five offshore islands off California	Both	Y/N
Fagatele Bay	0.3/0.7	1986	Tropical lagoon in sunken volcano mouth, American Samoa	Coastal	Y/N
Florida Keys	3,803/9,849	1990	Subtropical reefs and seagrass beds, Florida	Coastal	Y/Y
Flower Garden Banks	56/145	1992	Productive offshore banks off Texas	Offshore	N/Y
Gray's Reef	22/57	1981	Offshore sandstone reef off Georgia	Offshore	N/Y
Gulf of the Farallones	1,280/3,315	1981	Productive coastal waters outside San Francisco and around the Farallon Islands, California	Coastal	Y/Y
Hawaiian Islands Humpback Whale	1,366/3,538	1992	Humpback whales and their habitat surrounding the main Hawaiian Islands	Coastal	Y/Y
Monitor	1/2.6	1975	Wreck of the Civil War ironclad, off North Carolina	Offshore	N/Y
Monterey Bay	6,094/15,738	1992	Productive upwelling areas, rocky coasts, kelp forests off California	Coastal	Y/Y
Olympic Coast	3,189/8,259	1994	Productive upwelling areas, high concentrations of marine mammals and seabirds	Coastal	Y/Y
Papahanaumokeakua	139,797/362,073	2000	Tropical waters around Northwestern Hawaiian Islands	Coastal around islands, offshore HI	Y/Y
Stellwagen Bank	846/2,191	1992	Productive temperate waters around sunken sand and gravel plateau, off of Massachusetts	Offshore	N/Y
Thunder Bay	448/1,160	2000	Historically important shipwrecks in Lake Huron, Michigan	Coastal	Y/N

The California Marine Life Protection Act MPA Network
Governance Analysis

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1. CONTEXT

In 1999, the state of California passed legislation to create a state-wide network of marine protected areas (MPAs). The Marine Life Protection Act (MLPA) initiative, is currently in the process of planning and implementing the MPA network sequentially in four geographic regions of California. In the US, California's MLPA initiative constitutes the first state-wide MPA network.

Table 1.1: Attributes of California MLPA marine protected areas.

Study Region	**South Coast**	**Central Coast**	**North Central Coast**	**North Coast**
Status	Planned	Implemented 2007	Implemented 2009	Planning in Progress
Area of region	6090 km^2	2970 km^2	1980 km^2	2660 km^2
Coastline length of region	870 km	400 km	260	360 km
Number of no-take marine reserves	19	10	11	N/A
Total number of MPAs	37	29	24	N/A
Mean MPA area (reserves and other MPAs)	15 km^2	18 km^2	17 km^2	N/A
MPA network area (sum of MPAs)	569 km^2	529 km^2	397 km^2	N/A
Mean MPA length	4.0 km	6.6 km	4.7 km	N/A
MPA network length (sum of MPAs)	103 km	111 km	64 km	N/A
Offshore extent	Many MPAs extend to the limit of state jurisdiction – 5.5 km offshore			

Figure 1.1: California's MPA network and planning regions. MPAs shown in the central and north central coast regions were designated in 2007 and 2009 respectively. Those shown in the south coast region were still in the planning phase at the time of publication.

Table 1.2: State and federal socioeconomic attributes

	USA[18]	California
Population per km^2	31	84
Population growth rate	1%	1.6%
Per capita GDP	$48,000	$42,000
GDP growth rate	0.4% (2008 estimate) 2.1% (2007 estimate)	0.4% in 2008[19], previously 1.5%
GDP by sector	agriculture 1.2%, industry 19.6%, services 79.2%	statistics not available
Labor force by occupation	farming, forestry, and fishing 0.6%; manufacturing, extraction, transportation, and crafts 22.6%; managerial, professional, and technical 35.5%; sales and office 24.8%; other services 16.5%	farming, forestry, and fishing 1.3%; manufacturing, extraction, transportation, and crafts 21.1%; managerial, professional, and technical 36%; sales and office 26.8%; other services 14.8%
Unemployment rate	9.7% in 2008, previously???	11.2% in 2008, previously ??
Government type	Democracy	Democracy

When the MLPA legislation was passed, the state of California was experiencing strong economic growth. Midway through the implementation process (2008) California experienced a marked decline in GDP growth rate (Table 1.2), reflecting the global economic downturn. This economic downturn has raised concerns about the economic impact of MPA designation on coastal economies, and impacted the funding available for MPA implementation and enforcement.

In the U.S., population and economic output is concentrated in coastal states and even further concentrated in the coastal counties. In 2007 shore adjacent counties, which account for only 18% of the US land area, accounted for 36% of the national population and 42% of the national economic output (contributing $5.7 trillion to GDP). The ocean-dependent economy is a relatively small proportion of all the total coastal economy, generating $138 billion or 1.2% of the national GDP in 2004.

Table. 1.3: California ocean economy by sector - 2004[20] (from Kildow et al. 2009)		
Sector	**Employment**	**GDP-S (billions of dollars)**
Construction	31,871	$3.18
Living Resources	64,486	$7.32
Minerals	29,908	$19.61
Ship & Boat Building	163,164	$10.90
Tourism & Recreation	1,737,156	$69.65
Transportation	297,319	$27.58
Total	**2,323,904**	**$138.25**

[18] CIA world factbook https://www.cia.gov/library/publications/the-world-factbook/geos/us.html
[19] BEA http://www.bea.gov/newsreleases/regional/gdp_state/gsp_newsrelease.htm
[20] Kildow , J. T. , C. S. Colgan and J. Scorse. 2009. State of the U.S. Ocean and Coastal Economies. Published by The National Ocean Economics Program. Available on-line as a PDF file at: http://www.OceanEconomics.org/nationalreport

2. OBJECTIVES

The development of California's MPA network was driven by the Marine Life Protection Act, a state law passed in 1999. Key environmental groups and private foundations played a role in the development of, and lobbying for the legislation. Although the law was passed in 1999, early efforts to implement were hindered by funding limitations and a top-down approach that was not well received by stakeholders. The current approach to MLPA implementation features a transparent public process that utilizes extensive stakeholder involvement in MPA design. Funding for the process is provided by an innovative public-private partnership. The governor of California, Arnold Schwarzenegger, has expressed strong support for the MLPA since his election in 2003 and a desire to leave a lasting legacy of ocean protection.

The Marine Life Protection Act itself identifies six overarching goals:

(1) To protect the natural diversity and abundance of marine life, and the structure, function, and integrity of marine ecosystems.

(2) To help sustain, conserve, and protect marine life populations, including those of economic value, and rebuild those that are depleted.

(3) To improve recreational, educational, and study opportunities provided by marine ecosystems that are subject to minimal human disturbance, and to manage these uses in a manner consistent with protecting biodiversity.

(4) To protect marine natural heritage, including protection of representative and unique marine life habitats in California waters for their intrinsic value.

(5) To ensure that California's MPAs have clearly defined objectives, effective management measures, and adequate enforcement, and are based on sound scientific guidelines.

(6) To ensure that the state's MPAs are designed and managed, to the extent possible, as a network.

The MPAs designed to meet the 6 goals of the MLPA (above) fall into three main categories:

- State marine reserves (SMRs) are MPAs that prohibit take of all living marine resources and fit best into IUCN Category II. The percent of total MPA area that was designated SMR varies from region to region with 42% in the central coast region and 55% in the north central coast region.
- State marine conservation areas (SMCAs) are MPAs that allow limited recreational and commercial take of living marine resources and fit best into IUCN Category VI. The percent of total MPA area that was designated SMCA varies from region to region with 58% in the central coast region and 45% in the north central coast region.
- State marine parks (SMPs) are MPAs that allow limited recreational take of living marine resources and often have the specific objective of enhancing recreational opportunities. These MPAs fit best into IUCN Category VI. In the central coast and north central coast region, no MPAs have been officially designated as SMPs due to the need for coordination with state park authorities.

The MLPA goals are not designed to directly address any legal obligations at an international, national, or regional level, however, they do share commonality with resource management objectives from a wide variety of sources. For example, the MLPA addresses the recommendation from the Pew Oceans Commission (2003) to establish networks of marine reserves in coastal waters. The MLPA also encompasses a number of the guiding principles expressed in the US Commission on Ocean Policy report (2004), including ecosystem-based management, preservation of marine biodiversity, adaptive management, and utilization of the best available scientific information. The ecosystem-based management objective is also reflected in the Magunson-Stevens Fishery Conservation and Management Reauthorization Act of 2006, the West Coast Governor's Agreement on Ocean Health, (an agreement for ocean management between the governors of California, Washington, and Oregon), and the California Ocean Protection Act (COPA). The United States is not a party to the Convention on Biological Diversity, however, the MLPA does address several focal areas of the convention, including protecting the components of biodiversity, and maintaining the goods and services from biodiversity. Thus, although the MLPA does not directly address any higher legal mandate, it is clearly in step with marine conservation policy objectives both nationally and globally.

3. DRIVERS/CONFLICTS

The scope of the MLPA is limited to regulating extraction of living marine resources (e.g. fishing), however, the act recognizes that threats to the marine environment spring from a variety of sources, and indicates that MPAs, even those that limit fishing activities alone, may provide a valuable baseline for understanding the impacts of diverse human activities on marine ecosystems. Threats to California's coastal ecosystems include: fishing (recreational and commercial), water pollution (e.g. thermal, nutrient, chemical, point and non-point source nutrient pollution), invasive species, climate change, coastal development (e.g. beach nourishment and shoreline hardening), and power and water developments. Tourism and other non-extractive activities currently are not perceived as a substantial threat to coastal ecosystems in California.

- **Fishing:** Commercial and recreational fishing are culturally important in coastal California, but form a relatively minor portion of the coastal economy. In general, recreational fishing effort has remained relatively stable over the past 20 years, although statewide landings have declined.[21,22] In contrast, commercial fishing effort (as measured by the number of registered commercial vessels) and landings have both declined from a peak in the early 1980s.[21] Overall trends in fishing pressure mask the fluctuations in individual fisheries which can be substantial and driven by the development of new fisheries or markets, changes in fishing regulations, or the contraction of markets and fish stocks.
- **Water pollution:** Water quality regulations are generally strong in the United States, but water quality concerns, including sewage effluent, non-point source pollution from storm runoff and agricultural uses, increased sediment loads, and harmful algal blooms have the potential to negatively impact MPA performance. In general, the threats posed by water pollution are likely to increase, driven by California's growing population.
- **Coastal Development:** Like water pollution, coastal development is driven by a growing population in California. Coastal development is regulated by the California Coastal Commission, but increasing pressure to development valuable water-front property may pose threats to habitats within MPAs through shoreline hardening, destruction of coastal buffer habitats, and beach nourishment activities.
- **Power and water developments:** A growing population in California and a strong agricultural sector places ever-growing demands on limited water and power resources. Historically, most rivers within the state have been dammed to generate hydroelectric power and substantial flow diverted to support agriculture and development. The consequences of these dams and diversions on anadromous fish, such as commercially important salmon, can be dramatic. Statewide, few if any new dams are being built and the trend is toward dam removal and more fair allocation of water resources to support ecosystem services and human uses. Alternative water and power sources are being explored, but they, too, are likely to have consequences for marine life. Power and desalinization plants can entrain pelagic larvae in their intakes, reducing spawning success. The high temperature or high salinity effluent from these plants can also have impacts on the marine environment. Wave energy developments are also currently being explored in California with unknown consequences for marine life. It is unclear, as yet, how MPAs may restrict these developments within their boundaries.
- **Invasive species:** International shipping traffic and a growing population both bring and increased risk of invasive species introduction. Efforts to eradicate invasive species will not be restricted by MPA designation.
- **Non-extractive recreation/ tourism:** California's growing population is likely to drive increases in non-extractive recreation and tourism including diving, boating, surfing, tide-pooling, beach-going, wildlife-viewing, and sightseeing. These activities are not currently perceived to have a substantial impact on marine resources.

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[21] Scholz, A., C. Steinback, S. Klain, and A. Boone. 2006. Socioeconomic Profile of Fishing Activities and Communities Associated with the Gulf of the Farallones and Cordell Bank National Marine Sanctuaries. Available online as a PDF at http://www.ecotrust.org/jmpr/

[22] Dotson, R.C. and R.L. Charter. 2003. Trends in the Southern California Sport Fishery. CalCOFI Report. Vol. 44.

4. GOVERNANCE FRAMEWORK/APPROACH

California's MPA network is designated under the Marine Life Protection Act, and governed by the state through the California Department of Fish and Game (CDFG). The department is mandated with the enforcement of state MPAs, but budgets are limited. In select areas where MPAs fall within federal marine managed areas, such as the National Marine Sanctuaries or adjacent to terrestrial managed areas (local, state, or national parks), other agencies often provide assistance with enforcement and educational efforts, however, CDFG assumes primary responsibility for enforcement.

The California Department of Fish and Game's mission is "to manage California's diverse fish, wildlife, and plant resources, and the habitats upon which they depend, for their ecological values and for their use and enjoyment by the public." Due to the limited scope of CDFG jurisdiction, the MLPA is practically limited to regulation of fishing activities within the boundaries of designated MPAs. Furthermore, the MLPA is not a fisheries management mandate, so management of fishing activities that occur beyond the boundaries of the MPAs is distributed across state (CDFG and state legislature), regional (the Pacific Fishery Management Council or PFMC), and national (National Marine Fisheries Service or NMFS) agencies.

The MLPA has little or no power to regulated non-fishing activities that may impact marine communities and habitats, such as water pollution or geological extraction, however, a separate law known as the California Marine Managed Areas Improvement Act (MMAIA) provides for cross-sectoral coordination. For example, California State Water Control Boards are responsible for regulating water pollution and discharge into the marine environment and have the power to designate and enforce State Water Quality Protection Areas to protect marine species or biological communities from an undesirable alteration in natural water quality. The most common of these water quality protection areas are known as Areas of Special Biological Significance (ASBSs) and significant efforts have been made to co-locate MPAs and ASBSs to ensure that marine communities and habitats are protected from a variety of anthropogenic threats. National Marine Sanctuaries (NMSs) are another type of marine managed area that are managed at the federal level and often restrict mineral or oil extraction and construction activities. Efforts have been made to co-locate MPAs with NMSs and, where co-location is not feasible, to avoid designating as MPAs areas that support activities that are not compatible with ecosystem protection.

5. EFFECTIVENESS

Legally, the MPAs established under California's MLPA can only directly address the impacts of fishing. Although MPAs cannot directly address non-extractive threats, such as water pollution, coastal development, climate change, tourism impacts, or invasive species, other state and federal agencies may manage these impacts in MPAs in the future. The extent to which cooperative management of MPAs is effective in addressing the full suite of impacts, cannot yet be assessed due to the short time-frame since MPA implementation.

MPAs established under the MLPA have been enforced for three years or less, too short a time for accurate assessment of their effectiveness at restricting fishing activities. However, information from California MPAs established prior to the MLPA indicate that MPAs can effectively limit the impacts of fishing and allow the abundance and size structure of fished populations to recover.

Table 5.1: Impacts addressed and not addressed in MPAs established under the MLPA

Impacts Addressed	Impacts not Addressed
• **Fishing:** many MPAs are no-take and compliance is expected to be high, in MPAs that allow take, only non-destructive fishing practices are allowed. • **Habitat restoration:** laws allow the Department of Fish and Game to continue habitat restoration efforts in MPAs as needed • **Invasive species:** laws allow the Department of Fish and Game to pursue invasive species eradication efforts in MPAs as needed.	• Water pollution • Coastal development • Power/water developments • Non-extractive recreation/tourism

The MPAs established under California's MLPA should be categorized as a 3 on the effectiveness scale (some impacts completely addressed, some are partly addressed), because fishing impacts are fully addressed by MPA designations and adherence to fishing regulations is anticipated to be high, but many other impacts are not addressed by MPA designation.

6. INCENTIVES

Economic incentives

- Promoting economically and ecologically sustainable resource exploitation

The potential fisheries benefits of MPAs are widely discussed within the MLPA process, especially in the early phases of stakeholder education. Population modelling efforts employed by the Science Advisory Team illustrate trade-offs between fisheries yield and long term population sustainability and provide stakeholders with feedback about how their proposed networks may contribute to sustainability.

Overall, economic incentives play a relatively minor role in the MPA design process, which focuses more on minimizing the short-term economic costs of MPA establishment. Several factors contribute to the lack of emphasis placed on economic incentives: 1) Most of California's fisheries are already perceived to be well (or at least heavily) regulated by both state a federal agencies, and some of the most lucrative fisheries in California focus on species that are unlikely to benefit substantially from MPAs due to their mobility (e.g. Dungeness crab, salmon) or the fact that a large portion of their population occurs beyond state jurisdiction (e.g. rockfish). 2) The impact of MPAs on non-consumptive uses is not explicitly evaluated. 3) MPAs are still in the planning phase, thus the economic costs and benefits of their establishment are still hypothetical.

Economic incentives are likely to increase over time as MPAs and become effective at protecting populations of fished species and improving non-consumptive recreational opportunities.

Interpretive incentives

- Public communication, education and awareness raising on the importance/vulnerability of marine ecosystems and the benefits of the MPA through newsletters, web sites, education programmes, media campaigns, etc

The MLPA process includes a broad outreach effort to educate the general public about the conservation values of MPAs. One initial effort that leveraged the co-location of marine and terrestrial reserves was a series of informational meetings directed at state park docent programs, who in-turn interface with the visitors to the terrestrial state parks. Other outreach and education efforts include educational workshops conducted by MLPA initiative staff that are designed to inform stakeholders about the benefits of MPAs and the MLPA planning process.

- Promoting recognition of the potential benefits from well-managed MPAs, *e.g.* spillover to surrounding fisheries, enhanced resilience, ecosystem services.

The Science Advisory Team has evaluated the potential resource benefits and costs and used these evaluations to inform decision-makers and stakeholders. Conservation NGOs have promoted recognition of resource benefits. In addition to the potential benefits of spillover, enhanced resilience, and ecosystem services, MPAs have been identified as a tool to counteract continuing "sliding baselines" of perceived states of ecosystems and to inform ecosystem-based fisheries management by identifying ecosystem-wide consequences of fishing.

Interpretive incentives have played an important, but relatively minor role in the MPA planning process. If MPAs implemented under the MLPA are to succeed, the role of outreach and education will become increasing important with respect to MPA regulations and enforcement.

Knowledge incentives

- Maximizing scientific knowledge to guide/inform MPA decision-making

The MLPA Science Advisory Team (SAT) (which advises the MPA design process) is charged with bringing the "best readily available scientific information" to bear on the MPA design process. Practically, this means that efforts are made to maximize scientific information, but informational limitations are not used as an excuse for inaction. Inherent in this charge is the necessity of explicitly addressing areas of uncertainty. Guidelines for MPA design developed by the SAT incorporate scientific information from a variety of sources and methods and address the degree of agreement between different information sources. Much of the science used to inform the MLPA process evolves through a dynamic interaction between scientists, stakeholders, and the Blue Ribbon Task Force (BRTF) and is openly discussed in transparent public meetings.

- Promoting mutual respect and collective learning between different knowledge owners (*e.g.* scientists and local resource users)

Extensive interaction between the MLPA science team and stakeholder groups throughout the MPA design process promotes mutual respect for a wide variety of knowledge types. Scientists and stakeholders embark together on "joint fact finding" projects where they enhance one another's knowledge of local ecosystems while improving the information available for use in MPA planning. Since most scientific advice provided to the process is clearly explained to stakeholders and discussed among scientists in open public meetings, stakeholders develop a sophisticated understanding of the underlying scientific concepts and an ability to ask probing questions and recognize unmet scientific needs. One of the most rewarding parts of the process is the vibrant exchanges that occur between stakeholders (including life-long commercial fishermen) and scientists. More than a few fishermen leave the MLPA process eager to collaborate with scientists and contribute to scientific knowledge about the ecosystems they work in.

Knowledge incentives are one of three critical components for the success of the MPA design process. The science-based MPA design guidelines used in the process are key to steering the MPA design process toward MPAs that are likely to meet the conservation objectives of the law. The open discussion about these guidelines and their application plays a critical role in the process by providing a forum for exchange and shared understanding. As MPAs are implemented, the role of knowledge incentives is likely to change and become more closely linked to efforts to monitor and evaluate MPA performance.

Legal incentives

Legal incentives underpin the entire MPA design process in California. Without the firm legal mandate provided the MLPA, other incentives would likely have little impact.

- International-regional-national-local regulatory obligations that require effective MPA conservation, including the potential for top-down interventions, *i.e.* 'state capacity' to steer if not control MPA governance and address driving forces – pressures from immigration, corporate mass tourism, fisheries market forces, etc
- Clarity and consistency in defining legal objectives of MPAs, jurisdictional boundaries, roles and responsibilities of different authorities and organizations

The text of the Marine Life Protection act provides a clear legal framework with specific conservation objectives. The California Department of Fish and Game is clearly named as the agency responsible for implementation and enforcement.

In the MPA design process, great care is taken to ensure that MPA boundaries are simple, easily understood, and enforceable. Efforts are likewise made to ensure that MPA regulations are simple and compatible with existing fishing regulations. Other activities that may impact MPA performance but are not under MLPA jurisdiction are considered and avoided where possible in siting MPAs.

- Legal provisions to ensure public rights and transparency in MPA management processes

The entire MPA design process is transparent and open to the public. All decisions about MPA design and management are made in a public forum with opportunity for members of the public to comment and express their views.

- Legal or other official basis for cross-sectoral/cross-jurisdictional restrictions to support the achievement of MPA objectives

California's Marine Managed Areas Improvement Act (MMAIA) provides for cross-sectoral coordination across agencies to support achievement of MPA objectives.

- Scope for flexibility - adaptive management and local discretionary action, provided that this does not undermine the fulfillment of conservation objectives

The Marine Life Protection Act has provisions for adaptive management of MPAs by the Department of Fish and Game including periodic review of MPA performance. No provision is made for local discretionary action, although the California Fish and Game Commission is legally required to receive, consider, and act upon petitions to add, delete, or modify MPAs every three years. These petitions may be submitted by members of the public and other interested parties and are considered in a transparent public process.

- Provision of financial and institutional resources from the state for MPA governance, particularly law enforcement;

California's Department of Fish and Game is responsible for enforcement of MPAs using existing game warden resources and partnerships with other state and federal management agencies including State Parks, National Parks, and National Marine Sanctuaries.

Legal incentives are the most important type of incentive in the MPA design process, providing the basis for the participation of both scientists and stakeholders and a set of clear MPA network goals. Because the act requires the development of an enhanced, science-based network of MPAs, stakeholders and others are motivated to participate and cooperate, rather than question whether a network of MPAs is an appropriate policy. The act identifies the California Department of Fish and Game (CDFG) as the agency responsible for the implementation of the network and therefore creates the incentive for CDFG to engage fully in the process. Legal incentives had been upheld by strong state leadership, both from CDFG and from the governor of California. However, those with the final authority to designate MPAs (Fish and Game Commission) are relatively removed both in process and time from the MPA design. This disconnect threatens the integrity and trust placed in the process.

History shows that while legal incentives may be critical to the successful MPA design process, in California, a legal framework alone is not sufficient. Previous attempts to implement the Marine Life Protection Act without a public participatory process failed as a consequence of strong public opposition. The current effort which includes strong legal, knowledge, and participatory incentives is an expensive and time-consuming public process that is funded by a public-private partnership between the state of California and a private foundation.

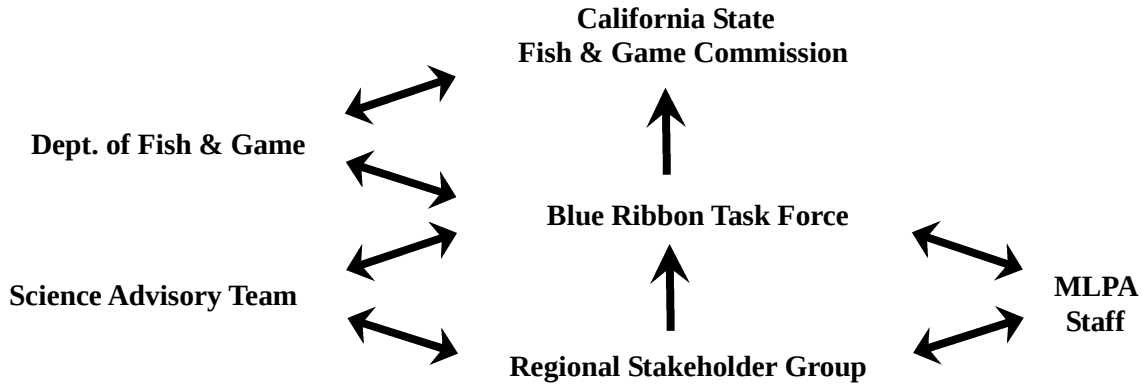
Although the simplicity of the regulatory framework (e.g. CDFG regulates only fishing) makes the MPA design process much more manageable than a larger inter-agency effort might be, it also has limitations that can be frustrating to both stakeholders and decision-makers. Greater and more clearly defined coordination between the regulators of cross-sectoral activities (e.g. water quality, mineral extraction, terrestrial activities) would improve governance.

Participative incentives

- Participative governance structures and processes such as stakeholder committees, stakeholder consultations, participative GIS planning, etc
- Transparent participation and decision-making processes
- Clear rules on the means and degree of participation from different groups
- Bringing in 'neutral' facilitators to facilitate participative processes;

The entire MPA design process is highly participative utilizing group decision-making and building relationships between diverse stakeholders, scientists, and the department (managing agency). Stakeholders play an integral role in MPA design and are the only members of the process who actually draw MPAs (see Figure 6.1). Scientific and political guidance is provided to the stakeholders by the Science Advisory Team and Blue Ribbon Task Force, respectively. The roles of the three design groups (stakeholders, science team, and task force) are clearly defined and carefully controlled by MLPA staff. For example, while stakeholders may provide scientific information, the science team is responsible for synthesizing that information and providing the formal scientific guidance. The science team does not, however, provide political guidance or indicate specific locations for MPAs. Neither the science team nor the task force makes any legally binding decisions about MPA designation, but rather work closely with the stakeholders in an iterative design process until a small number of MPA network proposals that are likely to achieve the MLPA goals have been developed. These proposals are then forwarded to the Fish and Game Commission for the final legal decision on MPA designation. Both the Department of Fish and Game and the MLPA staff support the design process, creating bridges between the three design groups and providing opportunities for productive exchange. The whole process is facilitated by neutral professional facilitators who play a strong role in maintaining order and productivity in public meetings. After MPA designation, the department is responsible for enforcement and management of MPAs and maintains communication with the commission and monitoring groups about all future MPA management decisions.

Figure 6.1. MLPA Initiative organizational structure



The MLPA is supported by a GIS-based online decision support tool called Marine Map (http://marinemap.org). This tool allows stakeholders to view habitat and effort distributions, draw and share proposed MPAs, and assess the habitats that they will protect with each shape. Marine Map also provides feedback about how well proposed MPA networks comply with science guidelines. This interactive tool, has greatly enhanced stakeholder engagement and empowered stakeholders to engage with scientists on a very direct level. The fully interactive version of the tool has only been available in the design process for the most recent region of the coast (southern California).

The participation of stakeholders supports the MPA design process and is critical to the success of the MLPA, as it promotes equity and stewardship of the resultant MPAs. Without stakeholder participation, opposition to a top-down approach to MPA designation would likely be strong. Participative incentives, however, are only effective in this case study in the context of strong legal incentives and combined with knowledge incentives to

guide MPA design. In the absence of a legal mandate for MPA designation and clear scientific guidance about MPA size, spacing, and habitat protection, a stakeholder-based design process would likely have limited success. The role of participative incentives in MPA management after designation is not yet clearly defined and the extent to which stakeholder participation is maintained in future MPA management will play a large role in the effectiveness of the MPAs.

7. KEY ISSUES

California's Marine Life Protection Act process employs a unique combination of top-down and bottom up governance techniques to effectively design a large-scale MPA network with 1) clearly defined conservation objectives, 2) a sound scientific basis, and 3) substantial stakeholder participation and buy-in. Legal incentives are the primary driver of this process, providing a legal framework for design and management of MPAs and clear goals for the MPA network. Participative and knowledge incentives play a secondary, but non-the-less critical role in the MPA design process. These incentives are built upon the foundation of the legal mandate and provide important structure for the MPA design process. Knowledge incentives take the form of an informational exchange between the science team and stakeholder group, and provide critical guidelines for MPA design that steer the design process toward MPAs that are likely to meet the conservation goals of the law. Participative incentives allow stakeholders to directly influence MPA design and take ownership of the difficult tradeoffs between conservation objectives and the costs of MPA implementation to various user groups. These three major incentives are mirrored in the structure of the three groups involved in MPA design: legal incentives are represented by the Blue Ribbon Task Force, knowledge incentives are expressed through the Science Advisory Team, and participative incentives are embodied in the Regional Stakeholder Group. In the MPA design process, interpretive and economic incentives play a relatively minor role.

As the MLPA process transitions from MPA design to implementation and management of the resultant MPA network, the role of interpretive and economic incentives is likely to increase, coming into a more equal balance with the currently dominant legal, knowledge, and participative incentives. Interpretive incentives will play a key role in educating the public about MPA regulations and promoting local ownership of MPAs. Economic incentives may become more apparent as MPAs become effective in increasing fished populations and improving non-consumptive use opportunities, such as diving and wildlife viewing. Legal incentives are likely to continue to play a large role in MPA management, as all management decisions will continue to be made by and enforced by the state Department of Fish and Game.

The Sanya Coral Reef National Marine Nature Reserve

Governance Analysis

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1. CONTEXT

Name: The Sanya Coral Reef National Marine Nature Reserve (SCRNMNR)
Size of MPA: 55.68 km^2
Coastline length (where applicable): data not available
Distance from shore: coastal site that includes intertidal and subtidal habitats

	National (2008 estimates)[23]	**Local (Sanya Municipality)** (2008 estimates)[24]
Population per km^2	138	294
Population growth rate	0.51%	0.87%
Per capita GDP (US$)	6,000	3,744 (domestic)
GDP growth rate	9.0%	16.8%
GDP composition by sector	Agriculture:11.3% Industry: 48.6% Service: 40.1%	Agriculture:21% Industry: 25.3% Service: 53.7%
Labour force by occupation	Agriculture:40.8% Industry: 26.8% Service: 32.4%	Not available
Unemployment rate	4.2% (urban areas)	1.35% (urban areas)
Government type	Communist state	Communist state

Table 1. Basic socio-economic indicators at national and local levels.

The MPA is located in the Sanya Municipality of the Hainan Province, China. Sanya has a boosting local economy, with tourism being the main driver of economic growth since the 1980s (Fig.1).

[23] Figures taken from the CIA world fact book https://www.cia.gov/library/publications/the-world-factbook/geos/ch.html
[24] Figures taken from the Sanya City Statistical Information Net http://www.systats.gov.cn/new_pages_tjsj_gb.php?xuh=472

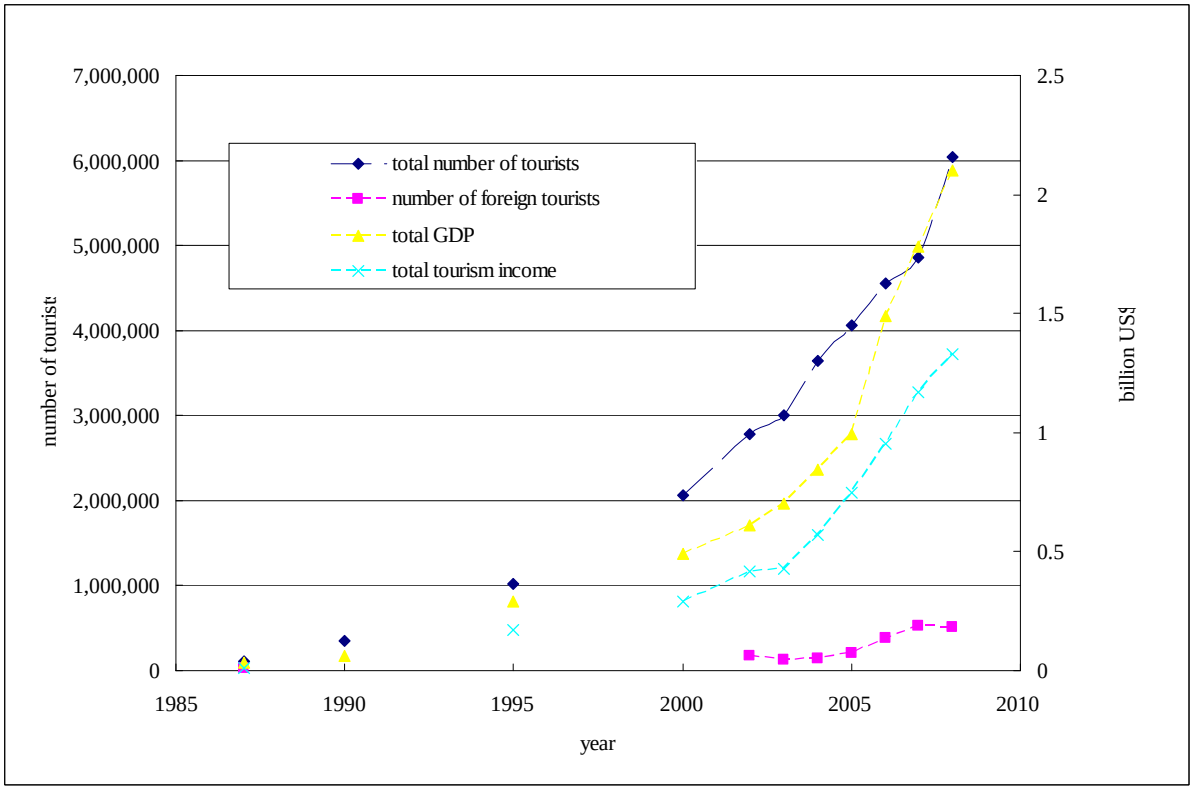

Figure 1. Trends in economic and tourism development in Sanya. Data from Sanya City Statistical Information Net (http://www.systats.gov.cn/new_tong_jsj_tjgb.php)

2. OBJECTIVES

The designation of the SCRNMNR is part of the effort to fulfil China's international and national environmental obligations, which include:

- Convention on Biological Diversity: establishing MPA networks that cover 10% of the marine areas under China's jurisdiction by 2011.
- World Summit on Sustainable development: establishing a representative network of MPAs in China by 2012.
- China Ocean Agenda 21 (1996): establishing a national MPA network for both biodiversity conservation and sustainable use of marine resources.
- National Marine Economic Development Plan 2000-2010: designating MPAs that cover 5% of the marine areas under China's jurisdiction by 2020.

The SCRNMNR Management Plan (2005-2010) outlined the management objectives of the SCRNMNR as follows:

- To preserve natural habits within the SCRNMNR, and to enhance the stability and/or recovery of coral reefs and other habitats within the SCRNMNR;
- To carry out controlled ecotourism activities within the SCRNMNR, under the condition that the natural growth and reproduction of coral reefs are maintained, and to enhance socio-economic development and environmental protection of the Sanya city;
- To develop the SCRNMNR into a base for marine research and environmental education, and to manage the SCRNMNR to become a model MPA in China.

The SCRNMNR is managed in accordance with various national and provincial laws and regulations, the most relevant ones are:

- Regulation on Nature Reserves of China (1994): this is the most important regulation for nature reserves (both terrestrial and marine) in China. Key aspects are:

  1) *Conservation vs. local development:* in the establishment and management of nature reserves, local economic development needs and livelihoods must be addressed properly (Article 5). However the Regulation does not further specify how to 'properly' address local economic needs, considering that any forms of natural resource extraction (fishing and collection of living and non-living resources) are prohibited within nature reserves (Article 26 and 27).

  2) *Nature reserve zoning scheme:* nature reserves are divided into core, buffer and experiment zones (Article 18). Specific restrictions in each zone type in the SCRNMNR are explained later.

  3) *Responsibilities of central and local governments:* national nature reserves (i.e. nature reserves designated by the State Council) should be managed by provincial or central government agencies, and local governments above the county level are responsible for financing nature reserves within their jurisdictions. The central government provides financial assistance for the management of national nature reserves (Article 21 and 23). It is clear from these provisions that the central government officially delegates most of its previous responsibilities in the management of nature reserves to its local constituencies.

  4) *Regulations on compatible economic activities:* conducting tourism and other compatible activities within national nature reserves must seek permission from the central government agency in charge of the administration of the affected site. All activities must not conflict with the conservation objectives of nature reserves (Article 29).

- Law on Marine Area Use (2001): any proposals for exclusive use of the sea within MPAs for periods longer than three months need to obtain permission from relevant marine authorities (for national marine nature reserves, this authority is the State Oceanic Administration). Marine area user rights for core zones in MPAs are reserved for MPA management authorities, who have exclusive rights to use the core zones for conservation purposes. The Law on Marine Area Use adds another layer of legal mandate for regulating activities within MPAs.

- Regulation on Coral Reef Conservation of Hainan Province (1998): prohibits destructive fishing practices (blast and cyanide fishing) in coral reef areas, coral mining and the collection and sale of corals in the Hainan Province.

At a site level, the zoning plan provides the basis for the regulation of activities within the SCRNMNR (Fig. 2 and Table 2).

	Core zone	Buffer zone	Experimental zone
Size (km^2)	10	13	32.68
Percentage of the total area of the MPA	17.9%	23.3%	58.7%
Official regulation	No-entry zone except for patrolling	No other uses except for scientific research and monitoring	No fishing and extractive uses, but compatible activities, such as tourism, education, scientific research, monitoring and artificial breeding of rare and endangered species can be carried out
IUCN management category	I	I	IV

Table 2. Official restrictions in different zones in the SCRNMNR.

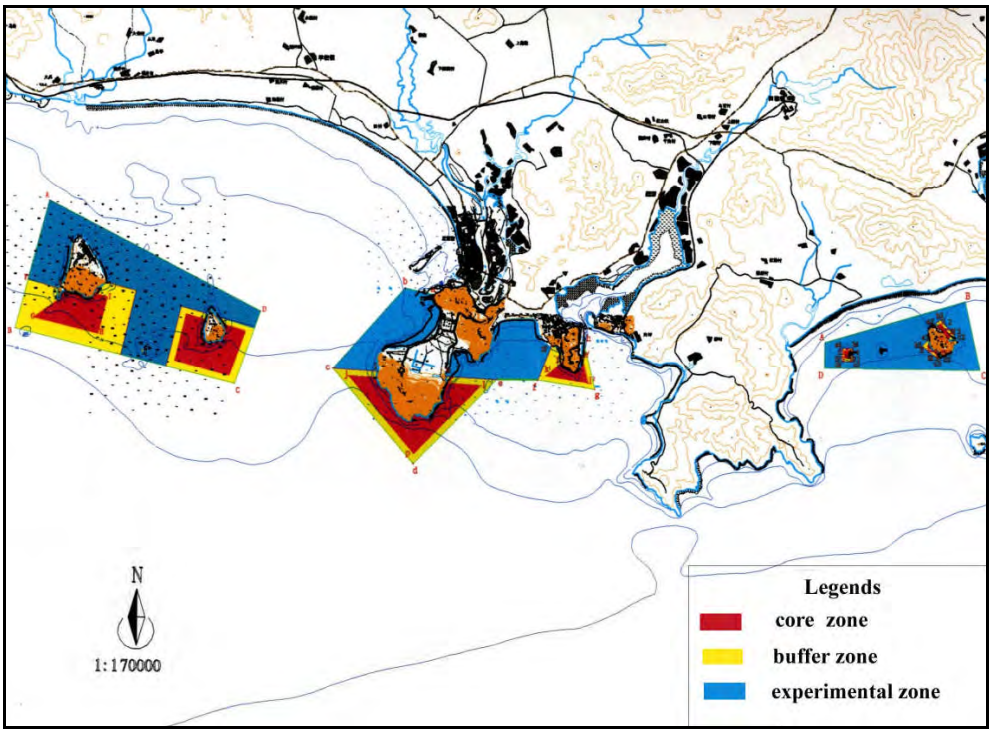

Figure 2. Zoning map of the SCRNMNR (HPODPI 2005).

3. DRIVERS/CONFLICTS

The main threats to biodiversity conservation within the SCRNMNR are mass tourism, recreational and small-scale fishing, coastal development and water pollution.

3.1. The impacts and driver of tourism

Uncontrolled tourism development, overcrowding and habitat destruction resulting from tourism infrastructure development (the building of marina, hotels and outdoor swimming pools) are major threats to the sustainability of the SCRNMNR. Tourism development in Sanya is mainly driven by improvements in living standards in China and the growing domestic demand for tourism services, as foreign tourists only account for 8.5% of the total tourist volume (Fig 1). Tourism impacts in the SCRNMNR are likely to increase in the future if sound management interventions are not in place.

3.2. The impacts and driver of small-scale and recreational fishing

Although all forms of fishing are prohibited according to official regulations, small-scale and recreational fishing still occur widely within the SCRNMNR. Common fishing gears used in the SCRNMNR include gill nets, hook-and-line, and fish traps. Coral reef survey within the SCRNMNR in 2006 showed that the average density of reef fish was 1 fish per m^2, and both the density and size of species of high commercial value were extremely low, indicating heavy fishing pressure (Kimura et al. 2008). The disappearance of high value species, particularly triton shells and large reef fish, may be responsible for the frequent outbreaks of their prey, the crown-of-thorns starfish, in recent years in the SCRNMNR (Kimura et al. 2008).

As tourism industry develops in Sanya, more and more villagers find jobs in tourism companies and the Sanya city, and the number of full-time fishers using the SCRNMNR has declined. In the Luhuitou village, a traditional fishing village near the SCRNMNR where all of its over 2,000 residents were once dependent on

fishing, now 75% of the residents make a living without fishing. However the impacts from recreational fishing are likely to increase if it continues to be uncontrolled.

3.3. The impacts and driver of coastal development and water pollution

Impacts from coastal development, including the construction of hotels, resorts and golf courses in the coastal areas in Sanya have been increasing in recent years. Rapid coastal development and urbanisation resulted in water pollution and increasing levels of terrestrial runoff in the SCRNMNR, and there is currently a lack of sewage treatment facilities in Sanya. There have been increasing levels of sediments in some locations, particularly in areas close to the Sanya city centre (personal communication with J Lian).

The impacts from water pollution and sedimentation are likely to increase in the future, as economic development and urbanisation further accelerate in Sanya. However progress has been made to improve sewage treatment facilities in Sanya, with the construction of six new sewage treatment plants being initiated in 2009.

4. GOVERNANCE FRAMEWORK/APPROACH

Through a series of decentralisation in China, the central government's roles in MPA management have been mainly limited to the development of policies, regulatory frameworks and technical guidelines, and providing limited funding for the MPAs designated by the central government. In other areas of MPA management, unless there is a serious public concern and/or conflict, the central government does not intervene directly. Local governments, therefore, often have greater responsibilities for and influences on the actual performance of MPAs in China (Qiu et al. 2009).

The SCRNMNR Management Authority, like other management authorities of MPAs in China, is not part of the central government. Before 2002, the SCRNMNR Management Authority was a unit within the Sanya Ocean and Fisheries Bureau, therefore under the direct supervision of the Sanya municipal government. However since 2002, because of the concerns about the intensification of tourism within the SCRNMNR, the SCRNMNR Management Authority has been taken over by the Hainan Province Ocean and Fisheries Department, and a delegate from the Department was appointed as the director of the SCRNMNR Management Authority, in an attempt to strengthen the Authority's legal power and its coordination with the provincial and central governments. However, due to a lack investment from higher-level governments, the enforcement of the SCRNMNR continued relying on local resources and institutions, which provided the opportunities for local governments and developers to 'capture' MPA governance and use their power and influences to promote economic development, often at the costs of the environment and local communities.

The dilemma for the provincial and central government agencies is that they need the support from the local actors in managing the SCRNMNR, but they also see conservation policies and regulations that do not serve short-term local development interests increasingly being blocked by the local government. For example, there have been long-standing disputes between the Sanya municipal government and the Hainan Province Ocean and Fisheries Department over the issuing of marine area user rights within the SCRNMNR. The Sanya municipal government has been insisting on granting marine area user rights to companies that have good relationships with them, which was resisted by the Hainan Province Ocean and Fisheries Department. The State Oceanic Administration retains the final decision on the issuing of marine area user rights within the SCRNMNR, but it rarely conducts independent investigations and usually follows the recommendations from the provincial government, who are required to make decisions in consultation with the local government. The decision on who can receive marine area user rights for tourism development in the SCRNMNR has been pending for years, in the meanwhile all tourism operators holding permits from the local government are allowed to continue their operations within the SCRNMNR.

The participation from local communities in the management of the SCRNMNR has been limited so far. The main focuses of community-oriented initiatives are to provide alternative livelihoods and to raise local

awareness for coral conservation.

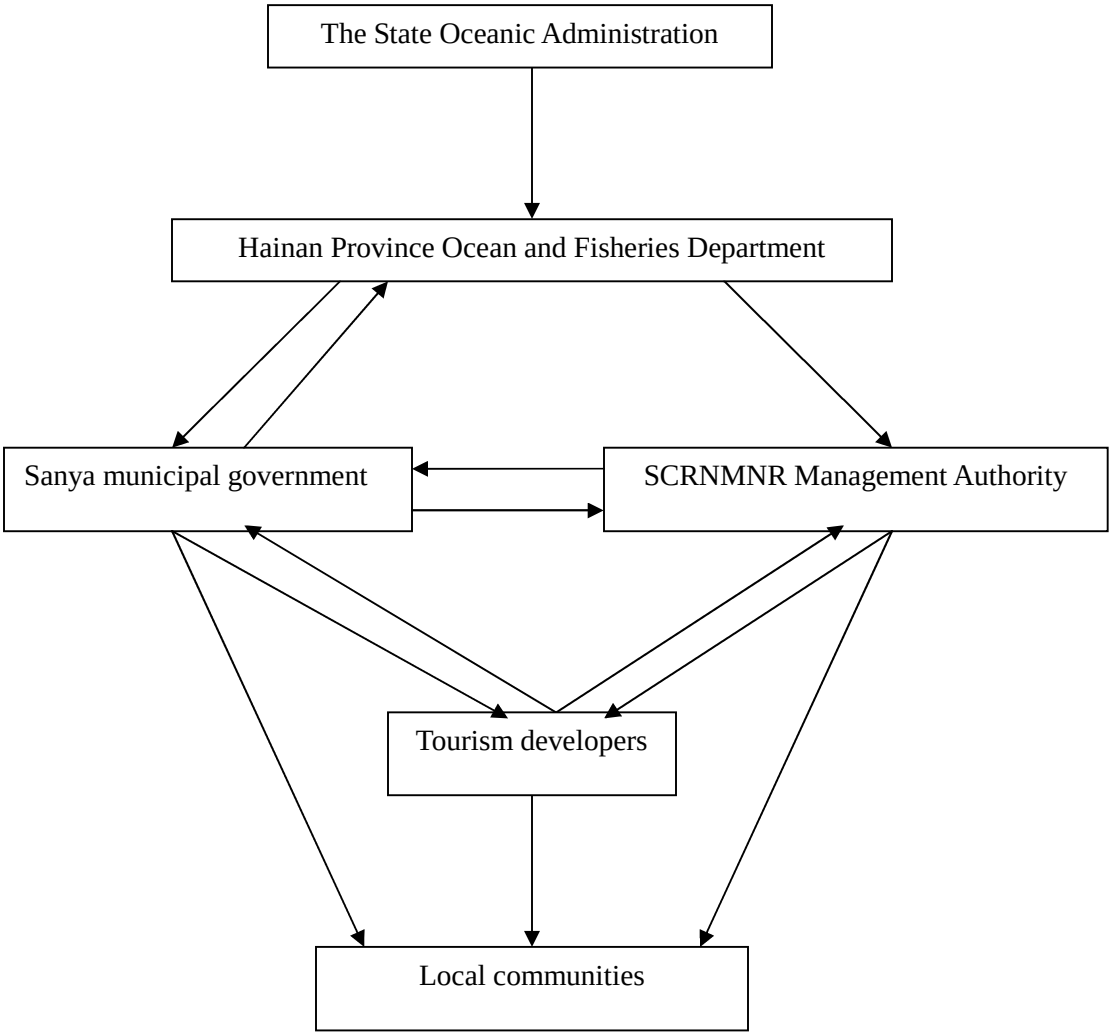

Figure 3. Governance structure of the SCRNMNR.

5. EFFECTIVENESS

Although the official MPA regulations prohibit fishing and economic activities that are not compatible with nature conservation, in practice a range of activities (see Table 3) are allowed to continue within the SCRNMNR.

Enforcement against destructive fishing practices, coral mining, seaweed farming (densely farmed seaweeds can block sun light and lead to high coral mortality), and new incoming tourism operators serves the interests of existing tourism developers and the local government who support them, therefore are actively supported by them and relatively effective. However, for activities that may undermine the interests of existing local users (tourism, small-scale fishing and mariculture) and the local government (coastal development), enforcement has largely been ineffective.

Impacts addressed	Impacts not addressed
■ Destructive fishing (blast and cyanide fishing and bottom trawling) (still happening but significantly reduced) ■ Coral collection (large-scale coral mining eliminated but illegal collection of corals still happening occasionally) ■ Seaweed farming (eliminated) ■ Incoming tourism operations (still common)	■ Tourism activities conducted by existing operators ■ Small-scale and recreational fishing ■ Mariculture (abalone and shrimp farming) ■ Coastal development and water pollution ■ Crown-of-thorns starfish outbreaks

Table 3. Impacts addressed and not addressed in the enforcement of the SCRNMNR.

Effectiveness scale: 2 (some impacts partly addressed but some impacts not yet addressed)

6. INCENTIVES

6.1. Economic incentives

- Promoting economically and ecologically sustainable resource exploitation

Before the development of tourism in the SCRNMNR in the late 1990s, most local villagers made a living by fishing and coral collection. Tourism, if well-managed, can provide more sustainable ways of resource exploitation.

- Fair sharing of economic costs and benefits

The development of tourism in the SCRNMNR has brought both benefits and costs to local communities. The benefits include employment opportunities, improved local infrastructure, stable income, and long-term development opportunities. However, salaries paid by tourism companies are stable but can be lower than the income generated from fishing and coral mining. In addition, one of the biggest losses of communities since the start of tourism development has been the loss of access to natural resources, both in the sea and on the land. Well-developed coral reef areas, where fish are abundant, have been occupied by tourism developers and are becoming increasingly inaccessible to local fishermen. Extensive coastal land has been leased out to tourism developers against the will of local communities (see section 6.5).

- Allocation or reinforcement of community/user property rights

The issuing of marine area user rights for tourism development within the SCRNMNR gives tourism developers the incentives to better manage resource use within the tourism area. For example, one of the tourism developers, the Yalongwan Underwater World Corporation, has successfully gained user rights for 7.6 hectares of sea in the experimental zone of the SCRNMNR, subject to renewal in every three years.

- Promoting alternative livelihoods

From 2002 to 2004, due to the development of tourism, local employment rate in the Ximao Island reached over 90% and the annual average income of local residents reached 3300 Yuan (US $483) per person. Since the development of tourism in the Ximao Island, there has been a huge reduction in the incidence of coral mining and fishing pressure in nearby coral reefs (XICV 2006).

- Improvements in local infrastructure and living standards

Employments in the tourism sector generate stable income for local communities, in addition, tourism companies also invested in local infrastructure such as schools and roads, and brought electricity and piped water

- Protection from incoming users

The enforcement of the SCRNMNR mainly targets non-local fishing boats and tourism activities run by companies based outside the SCRNMNR, thus protects the economic interests of local and existing users.

- Funding from private or NGO sources to promote the effectiveness of the MPA through the use of various incentives

Funding from tourism developers has been used to support the use of economic, interpretive and legal incentives, but over-reliance on private funds does lead to a level of institutional capture as discussed in section 4.

The use of economic incentives appears to be the main mechanism through which the conflict between nature conservation and local development needs is being addressed in the SCRNMNR. Fairer distribution of benefits from tourism development is the key to further improve the effectiveness of economic incentives.

6.2. Interpretive incentives

- Public communication, education and awareness raising on the importance/vulnerability of marine ecosystems and the benefits of the MPA

The SCRNMNR Management Authority has organised various education and outreach programmes on the biological features of coral reefs and the importance of protecting coral reefs and other marine resources, such as ocean day events and giving talks in local secondary schools.

- Promoting recognition of the potential benefits from well-managed MPAs

Booklets with information on the ecosystem services provided by healthy coral reefs (e.g. supporting fisheries and reducing coastal erosion) have been distributed in local communities.

Interpretative incentives play an important role in influencing public attitudes towards the MPA over a longer time frame, but it is not as important as other incentives (legal, economic and participative) in addressing immediate environmental and social concerns in the SCRNMNR.

6.3. Knowledge incentives

- Maximising scientific knowledge to guide/inform MPA decision-making

There have been some efforts to monitor the status of coral reefs within the SCRNMNR. The conclusion from the 2006 monitoring report is that in general, coral reefs within the SCRNMNR are in good condition and recovering from past damages, however the density of indicator species (reef fish and invertebrates) are low, indicating the impacts of historical and continued fishing in the area.

There has been very limited use of knowledge incentives in the SCRNMNR, and better designed research and monitoring programmes are needed.

6.4. Legal incentives

- International-regional-national-local regulatory framework that require effective MPA conservation

Such a regulatory framework already exits, see section 4.

- Clarity and consistency in defining legal objectives of MPAs, jurisdictional boundaries, roles and responsibilities of different authorities and organisations

These are all established under the Regulation for Nature Reserves and the Law on Marine Area User Rights. However the regulatory framework remains incredibly vague regarding how to 'properly' address local development needs in nature reserve management (see section 4).

- Legal provisions to ensure public rights and transparency in MPA management processes

So far there has been no statutory requirement for involving local communities and other resource users in the management and decision-making of MPAs in China.

- Legal or other official basis for cross-sectoral/cross-jurisdictional restrictions to support the achievement of MPA objectives

The Regulation on Nature Reserves gives the SCRNMNR Management Authority the legal power to manage and control activities that are beyond the boundary of the MPA, which may potentially affect the environmental quality in the SCRNMNR; however it is often difficult to implement given the SCRNMNR Management Authority's limited resources and technical expertise.

- Scope for flexibility - adaptive management and local discretionary action

The approach to designate a marine nature reserve in such a densely populated and rapidly developing city largely ignores the social-economic and political contexts in Sanya and leaves little scope for adaptive management and local support. The National People's Congress is drafting a new protected area legislation which aims to address this problem by taking a more diversified and less restrictive approach to the management of protected areas in China.

- Provision of financial and institutional resources from the state for MPA governance, particularly law enforcement

Currently most costs of enforcement in the SCRNMNR, including the building and maintenance of three patrol stations, salaries of 17 wardens, boat fuel and equipments, are covered by tourism developers. However the

new protected area legislation may require the central and provincial governments to provide sufficient funding for national nature reserves.

Legal incentives are the second most important type of incentives used in the SCRNMNR, after economic incentives. To improve the effectiveness of legal incentives, a better legal framework, and more state capacity and political will for strategic conservation are needed.

6.5. Participative incentives

- Maintaining, building on/working through local institutions as much as possible

The enforcement of the SCRNMNR has been supported by local institutions, e.g. the Sanya Ocean and Fisheries Bureau, local police force, local village committees, and tourism developers. However it is a challenge to further involve local institutions in regulating their own activities.

- Addressing social/environmental justice issues

Inequity and injustice in the development of tourism in the SCRNMNR are major obstacles to increasing community participation. In two villages in the SCRNMNR, extensive coastal farming land (around 200 hectares in one village) traditionally belonged to local communities in a collective ownership was taken away by the local government and leased to tourism developers. This action was against the law and the will of local residents, who were poorly compensated. The conflicts resulted in a fractured community-government/developer relationship and made it difficult to foster genuine participation from communities in the management of the SCRNMNR.

Participative incentives are less important than economic and legal incentives. Fostering genuine community participation requires a legal basis and social justice issues to be addressed.

6.6. Cross-cutting issues

6.6.1. Leadership

The lack of leadership from the central government has a huge influence on the governance of the SCRNMNR. It results in a lack of financial and institutional resources available for law enforcement, which led to the poor implementation of conservation regulations and opportunities for local governments and developers to 'capture' MPA governance. The central government's reluctance to intervene when local government's actions resulted in significant environmental and social costs is rather unfortunate, considering that the SCRNMNR is a national nature reserve and under the central government's jurisdiction. The lack of leadership from the state thus undermines the effectiveness of legal, economic (i.e. fair distribution of economic costs and benefits) and participative (i.e. addressing social justice) incentives.

6.6.2. Equity

As discussed in sections 6.1 and 6.5, the development of tourism in the SCRNMNR is a mixed blessing for local communities, who are still struggling with the inequity and injustice imposed on them. Inequity has both

direct and indirect impacts on the effectiveness of governance incentives. Without inequity issues being addressed, it is difficult to increase local awareness and support for the MPA, therefore undermining the effectiveness of interpretative and participative incentives. Further more, inequity and the lack of genuine participation from local communities further increases power imbalances and provide more opportunities for powerful local elites to capture MPA governance and the benefits from the MPA, which undermines the effectiveness of legal and economic incentives.

6.6.3. Stewardship

The loss of local communities' access to ocean and land resources due to tourism development (through lawful and unlawful means) is a main source of social inequity in the SCRNMNR. Currently local communities do not have the capacity and resources to start their own tourism and other business ventures, but it is essential that at least some natural resources can be reserved for the long-term development of local communities.

7. KEY ISSUES

The problems encountered in governing the SCRNMNR come from the challenge to address nature conservation obligations in an era of rapid economic growth coupled with decentralisation, in which economic development is given an overwhelming priority and any initiatives that hinder short-term economic growth may generate political tensions and local resistance, as well as the challenge to address social equity and justice in a society where there is a historical and continued lack of democratic representation and participation. While recognising that these wider-scale political and institutional challenges can not be adequately addressed in the short-term, efforts can be directed to enable a better balance of power through the empowerment of both conservation agencies and local communities. More and better ways of steer from the state are needed to enhance conservation at local levels, *e.g.* through a better designed legal framework with clear conservation mandates as well as scope for local discretional actions to induce compliance and engage local actors, sufficient funding and other financial incentives, and making the effectiveness of protected areas a key criteria for the assessment of local officials' performance. Legal protections of the rights of local communities, particularly to vital natural resources such traditional fishing grounds and collectively-owned coastal land, and encouraging small-scale tourism ventures run and owned by local communities will also be essential to foster a sense of stewardship amongst local communities, and a more equitable way of MPA management.

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Seaflower Marine Protected Area

Governance Analysis

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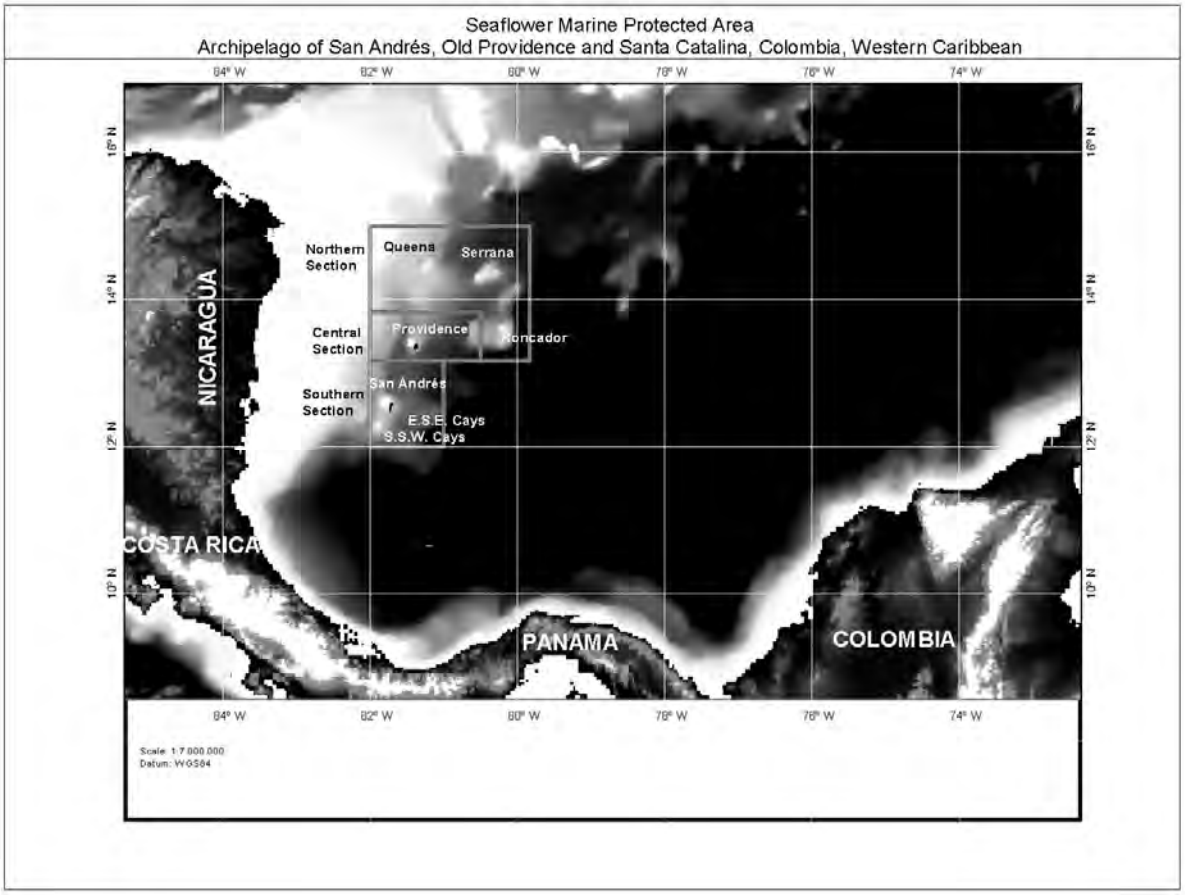
1. CONTEXT

Name of MPA: Seaflower MPA, San Andres Archipelago, Colombia
Size of MPA: 65,000 km^2. The MPA is divided into three management units -- Northern 37,500 km^2, Central 12,700 km^2, and Southern 14,800 km^2 – that comprise a sub-national network.
Coastline length (km): N/A (Seaflower is an open ocean MPA surrounding the San Andres Islands)
Distance from shore: N/A
Population per km^2: 2,444 (San Andres 2005)
Population growth rate: 4.19 (San Andres 2001)
Per capita GDP (PPP US$): $8,900 Colombia (San Andres unknown/poverty rate 40+% 2000)
GDP growth rate: 3.5% Colombia (San Andres unknown)
Labor force by occupation: Tourism and related commerce (45%), government employment (37%), fishing, farming (San Andres 1999)
Unemployment and underemployment: 53.6% (San Andres 2000)
Government type: Republic, with the executive branch dominating government structure



2. OBJECTIVES

Legal basis

The Seaflower MPA is located in the marine area of the Seaflower Biosphere Reserve (UNESCO 2000) and was declared in 2005 by the Minister of Environment, Housing, and Territorial Development (Resolution 107/05). Resolution 107/05 legislated that management of the Seaflower MPA is under the jurisdiction of the regional environmental management authority, CORALINA, making it the first MPA in the nation and also the first protected area to be declared nationally and managed regionally.

A number of international agreements and national laws provide the framework for coastal and marine management in Colombia. CORALINA is the government agency responsible for implementing international and national laws and policies in the archipelago. Therefore, although the Seaflower MPA was driven by the community in response to local needs, the MPA was designed in accord with the relevant framework for marine conservation and is managed to advance directives and guidelines related to conservation and sustainable development. The most significant of these are:

International:

- Millennium Development Goals, especially numbers 1 (eradicate extreme poverty and hunger) and 7 (ensure environmental sustainability)
- Convention on Biological Diversity (CBD) and Jakarta Mandate
- ILO Convention 169 on the rights of indigenous peoples (national law 21/91)
- Seville Strategy & Statutory Framework of the World Network of Biosphere Reserves

- Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (national law 56/86) and Protocols (SPAW 1990, LBS 1999)

National:
- Congressional Law 99/1993 – defined the national environmental framework, establishing CORALINA and declaring the San Andres Archipelago a Biosphere Reserve
- Congressional Law 165/1994 – defined the National Biodiversity Policy
- Congressional Law 136/1994 - declared mangroves protected areas throughout the nation
- Minister of Environment Resolution 1426/1996 – declared the archipelago's coral reefs special management areas

Local:
- Environmental Plan for Sustainable Development of the Archipelago, 1998-2010 – called for management of cays and banks, and definition of marine reserves to protect biodiversity (now replaced by the long-term plan, 2007-2023, that expanded the call for marine conservation and solidified Seaflower's role)

MPA objectives
The Seaflower MPA takes a holistic, sustainable development approach to conservation and has a mission statement and package of five legally defined, integrated objectives of equal importance. The concept is that conservation can only be successfully and sustainably achieved if all five objectives are met. The mission is to conserve biodiversity and ensure sustainable use of coastal and marine resources in the archipelago, while enhancing equitable benefits for the local community. This is achieved through five linked objectives, which are:

Objective 1: Preservation, recovery, and long-term maintenance of species, biodiversity, ecosystems, and other natural values including special habitats.
Objective 2: Promotion of sound management practices to ensure long-term sustainable use of coastal and marine resources.
Objective 3: Equitable distribution of economic and social benefits to enhance local development.
Objective 4: Protection of rights pertaining to historical use.
Objective 5: Education to promote stewardship and community involvement in management.

3. DRIVERS/CONFLICTS

The main activities supported by the Seaflower MPA are artisanal, subsistence, and industrial fishing, and marine tourism and recreation, including sport diving, boat tours, and small boat rentals. Major impacts derive from over-exploitation of marine resources, not only from artisanal and industrial fishing, but also from uncontrolled subsistence gathering. This leads to occasional conflicts between artisanal fishers, subsistence gatherers, and recreational users when competing for the same resources, especially in the crowded San Andres coastal waters (Southern Section). These activities and poorly managed terrestrial activities such as coastal development, spreading urbanization, and deforestation are negatively affecting Seaflower's ecosystems and biodiversity. Land-based pollution and unsustainable tourism practices such as poor diving techniques, groundings from watercraft, and overuse of popular sites, also impact biodiversity and ecosystem condition. Another factor is sedimentation from erosion and deforestation, especially in Old Providence where cattle raising on the steep hillsides is having a detrimental effect.

A major local driver of these threats is population pressure on resources and ecosystems. San Andres has the highest population density of an oceanic island in the Americas and one of the highest in the world, with recent research revealing that the basic needs of over 40% of the population are unmet. The steady influx of migrants from the Colombian mainland has led to extreme competition for scarce resources, particularly in San Andres. Poverty and growing food insecurity have serious repercussions on the coastal and marine environment.

Furthermore, a high level of resentment is felt by native islanders (*raizales*) because of the take-over of their traditional sea area and the depletion of marine and coastal resources by poor migrants from the mainland of Colombia, continental exporters, and the tourist industry, which is run by non-natives. The *raizal* people feel additionally marginalized because their native language, (English), religion (Protestantism), and customs are very rarely adopted by the newcomers. Exploitation of coastal and marine resources by non-*raizales* adds another layer of threat through the loss of cultural links, traditional knowledge, and indigenous management practices.

In addition to the local drivers of unsustainable population levels, poverty, and food insecurity, marine ecosystems have been increasingly affected in recent years by global drivers of biodiversity loss including introduced species and climate change. National policies and economic drivers also cause impacts. Over-exploitation of resources results from poorly regulated international and national high-intensity, commercial fisheries that provide little local benefit, adding to the archipelago's already weak economic situation and lack of food. This leads to conflicts between commercial and artisanal fishers. Issues are the increasing difficulty of access to collective fishing grounds by native fishers, failure to respect or acknowledge traditional fishing rights and sea tenure by industrial fishers and authorities, over-fishing including exploitation of endangered species and juveniles, and neglecting to enforce regulations on legal and illegal industrial vessels.

There are also conflicts with authorities related to militarization of archipelago waters and weak enforcement. In regard to the former, smuggling through the region, mainly of drugs, has increased the military presence. Although major abuses of power do not occur, the resulting atmosphere is detrimental to the expansion of marine and dive tourism, and intimidates and alienates artisanal fishers. The language and cultural differences between *raizal* fishers and continental military personnel exacerbate these conflicts. In regard to enforcement, there are issues on both sides. Conflicts between resource users and authorities emerge from the users' failure to respect MPA zoning and general regulations that prohibit extraction of sand, capture of endangered and threatened species, and use of certain fishing gears. Users can also fail to comply with size limits, closed seasons, and quotas for key commercial species. On the other hand, a main complaint of MPA users is the failure of authorities to consistently and impartially enforce zoning and regulations.

4. GOVERNANCE FRAMEWORK/APPROACH

Management approach

The Seaflower MPA takes a community- and ecosystem-based approach implemented through multiple-use zoning. Local stakeholders and CORALINA agreed that a multiple-use MPA would be a viable tool to reduce human impacts and threats on productive, vulnerable ecosystems and also improve sustainable use of marine resources. The archipelago's socioeconomic situation meant that MPA planning had to take cultural and economic realities into account for conservation to be effective. Stakeholders decided that properly designed zoning done collaboratively could serve both conservation objectives and local needs, so the MPA is zoned for management levels ranging from total protection to controlled industrial fishing.

The five zone types are: 1) no-entry, with use restricted to research and monitoring (116 km^2); 2) no-take, allowing a variety of non-extractive uses (2,214 km^2); 3) artisanal fishing, for use by traditional fishers only (2,015 km^2); 4) special use, for specific uses like shipping lanes, large-vessel anchorage, ports, and marinas or uses with the potential to generate conflict like heavily used water sports areas (68 km^2); and 5) general use, where minimal restrictions apply to preserve MPA integrity and promote marine conservation. Zoning took into account replication so all sections include entire representative ecosystems, and conservation zones are sizeable and dispersed to maximize resilience. The three sections are contiguous to minimize fragmentation and "edge effect" and include the open ocean between the reefs and atolls. Finally, to ensure connectivity, zones include integrated ecosystems; for example, a section of barrier reef with its corresponding lagoon, seagrass beds, and mangroves in a single no-take zone to encompass the full spectrum of species and genetic diversity.

Management plans

- Draft Seaflower MPA Integrated Management Plan (IMP) in 2005, Parts I (background), II (management), and III (operations) completed and under participatory review by stakeholders and technical experts
- Key Species Conservation Action Plans (shore and sea birds, lobster, sharks, and conch) in 2005-06
- Seaflower MPA management structure, including Advisory Committees with formal agreements celebrated between committee members and CORALINA in 2005

Management structure

Resolution 107/2005 of the Minister of Environment, Housing, and Territorial Development (MAVDT) declared that the Seaflower MPA would be under the jurisdiction of CORALINA and that this agency would act as sole management authority. The resolution further clarified that the National Natural Park System would remain responsible for administration of any areas that were already declared national parks at the time of the resolution. The sole such area is Old Providence McBean Lagoon, located inside the Central Section, so CORALINA and the Office of National Parks maintain a close, compatible working relationship in this section. The declaration did not affect the responsibilities of any other institutions at national, departmental, or municipal levels. Therefore, offices that shared in fisheries management at the time of the resolution still work together, maintaining their customary roles in regard to fishing in and out of MPA waters. These include the Departmental Fishing Board, of which CORALINA is a member, the Colombian Institute for Rural Development (INCODER) and Secretary of Agriculture and Fisheries, as the other institutional members of the Departmental Fishing Board.

The Seaflower MPA is part of the larger Seaflower Biosphere Reserve, which is also under the jurisdiction of CORALINA and is managed in accord with UNESCO guidelines and the Man and the Biosphere Program's integrated approach that links conservation with economic and social development. Specifically, the MPA management structure includes Advisory Committees with representatives from institutions and marine user groups - the Stakeholder Advisory Committee (SAC) and Inter-Institutional Committee (IIC). There is also an International Advisory Board (IAB). Advice can be solicited at any time from the IAB by CORALINA at the request of the MPA project team, SAC, or IIC.

Management issues

The primary constraints to management are lack of secure funding, poverty, a history of poor governance, and the MPA's size and remoteness. First, CORALINA is very poorly funded. Less than a third of its annual budget and virtually none of its program budget are government-funded, so raising money to support activities is an on-going struggle. This results in initiatives that are project and donor-driven and lack continuity in programming, staffing, and building institutional capacity. A financial sustainability plan has been completed for the MPA, and CORALINA has recently obtained resources from the Global Environment Facility (GEF) to put the recommended measures into effect. However, until these measures are operational, management remains dependent on special project funds and grants.

Management also faces the challenge of implementing the MPA's multiple objectives to alleviate poverty and advance sustainable development. Located in an archipelago where unemployment is over 50% and poverty is growing, the MPA must recover sustainable livelihoods, create jobs, and generate revenue besides meeting conservation objectives. A tradition of ineffectual governance and lack of coordination have contributed to problems. Historically, management and enforcement have been lacking, not only in the marine area but in general, contributing to a culture of lawlessness, mistrust of authority, and lack of transparency.

The size and remoteness of the protected area, the complexity of the ocean ecosystems, and high levels of biodiversity combined with high vulnerability also challenge management. For example, the distance to the Northern Section makes implementation and enforcement difficult and costly. CORALINA has neither financial resources nor equipment (including a vessel) to visit the Northern Cays. Work has been carried out sporadically by brokering space on other institution's vessels or with support of international partners.

Therefore, at this time, the designation of the MPA, its advisory committees, and institutional partnerships, together with its holistic sustainable development approach to conservation and its biosphere reserve status, provide a solid framework for conservation and management of all three MPA sections but this has yet to be fully implemented.

5. EFFECTIVENESS

Zones have been mapped and policies to reduce overfishing, land-based pollution and sedimentation, coastal population, and to adapt to climate change impacts have been developed. As mentioned above, lack of staff and budget combined with weak institutions and coordination has curtailed CORALINA's ability to achieve MPA objectives. To help ameliorate this, during the 15 years of its existence CORALINA has concentrated on institutional strengthening and establishing partnerships with local, national, and international institutions; NGOs; the private sector; and stakeholders. Problems of governance and lack of coordination between institutions, while substantially improving, are still manifest in inadequate infrastructure and communication systems. This limits information management and access to data.

On the other hand, institutional support for the MPA is strong. This also extends to the community (surveys showed 96% of fishers and 81% of watersports enterprises believe the MPA will benefit them). This is partly because the marine resource users themselves chose the MPA as the solution to problems and threats they identified. Involving stakeholders throughout the planning process fostered trust, besides improving MPA design. Very active participation resulted. With MPA users involved in implementation, monitoring, and enforcement, it is hoped that this high level of support will continue to manifest itself in growing volunteerism and compliance.

However, results of research and monitoring since 2006 reveal that, despite the formal establishment of the MPA, the condition of most resources has remained the same or even declined. For example, in regard to species, a spiny lobster stock analysis showed a fishery that is presently stable but at high risk of over-exploitation, and surveys of seabird colonies revealed reductions in numbers. As for ecosystems, monitoring showed that coral condition has remained generally the same, but the condition of reef sites popular with divers and tourists has declined as have some seagrass beds. Exceptions are mangrove coverage, which has grown, and queen conch populations, which show signs of recovery; both as the result of effective regulation, management, compliance and enforcement, and education.

To date the MPA has been unable to contribute to slowing the decreasing quality of life and growth of poverty in the islands. For the MPA to succeed as a tool to improve the economy and quality of life, programs to improve the sustainability of traditional livelihoods are essential along with the introduction of alternative livelihoods. Effective, nonbiased enforcement is also a priority. These are major components of the new GEF-funded project (2010-2014) to strengthen Seaflower implementation. At this time (prior to the new project), the Seaflower MPA would be at "1" on the scale of effectiveness of governance incentives (some impacts beginning to be addressed), with the MPA designation and related governance initiatives having positive impact (+), and the direction MPA effectiveness is going classified as "recovering" (+).

6. INCENTIVES

Economic incentives

- No-take and no-entry zones help move towards sustainable consumptive and non-consumptive use of resources. The MPA also includes artisanal fishing zones for exclusive use by traditional fishers, which are often zoned adjacent to no-take zones to ensure that the benefit of any spill-over first goes to traditional fishers.

- CORALINA is expanding its work with local fishing cooperatives, through activities such as training fishers in underwater photography and as tour guides, exploring low-tech aquaculture, and providing small business and marketing support to develop green markets.
- Considering the size and breadth of the MPA, it generates a number of direct jobs in many fields such as marine science, economics, law, education and outreach, public relations, and others and will generate even more at full implementation. All MPA jobs go to the local community, reducing unemployment and creating sustainable income opportunities.

Interpretative incentives

- Public communication, education, and awareness-raising are major components of MPA programming. Activities include managing public document centers to make information widely available to the community; information management systems; island-wide, diverse meetings and events targeting all stakeholders, ages, and levels of the wider community; media campaigns; local, national, and international presentations; introduction of formal school curricula on coastal and marine ecosystems; and a variety of publications for children and adults.

Knowledge incentives

- Extensive ecological monitoring (ecosystem condition, key species) is carried out and some socioeconomic monitoring has been done, but monitoring protocols/programs will be streamlined and redesigned in 2010. The idea is to ensure that MPA management measures and effectiveness are informed by relevant, up-to-date monitoring and analyses; performed by trained personnel; and developed within an adaptive, question-based context. Activities will include monitoring ecological, socioeconomic, and management effectiveness. Methods to monitor the success of education and outreach will also be developed.

- Integrating indigenous and technical knowledge is central to the Seaflower approach. All stakeholders have voice, access to spaces in which to exercise their voice, and the opportunity to be consulted and have their ideas incorporated into MPA planning, management, education, research, and monitoring. Scientists, managers, and MPA users meet frequently and work together on a number of initiatives. It should be noted that all management decisions integrate scientific knowledge with indigenous knowledge, which in itself requires regularly bringing together scientists and community. The MPA also employs community promoters, who are well-known to the community and who facilitate grassroots interaction in any number of ways.

- The MPA management structure includes stakeholder and institutional advisory committees. As mentioned, there is also the IAB, composed of experts in marine conservation and MPAs who work with Seaflower. Specific community-based monitoring programs in place include ReefCheck, RECON, COSALC, and REEF, along with joint activities such as community clean-ups, volunteer inspectors, and the adopt-an-ecosystem program (beaches, mangroves, etc.). Stakeholders also regularly support research.
- Seaflower's implementation is participatory and collective learning is emphasized. Consultations, training, and participatory workshops and programs are on-going and constant. Notable examples were the coming together of all stakeholders in mapping workshops to identify and agree on the external boundaries and multiple-use zones (a major achievement), and the introduction and successful completion of a technical degree program at a local university that trained young *raizales* from poorer families to take on jobs in coastal and marine management.

  Examples of other participatory learning activities include training authorities and institutions (coast guard, navy, fisheries, etc); stakeholder on-island training courses in marine conservation and sustainable use in fisheries, tourism, and farming; stakeholder off-island training (e.g., fishers to Jamaica, divers to Bonaire) with on-island expert follow-up; program of artisanal fishers training children in traditional practices;

PADI training for artisanal fishers and youth; and a variety of programs for children and young people (children's clubs, marine stewards, etc).

Legal incentives

- The MPA has a solid legal framework in place. Jurisdictions and roles overlap somewhat, especially in regard to fisheries (as is the case in many locations), but so far institutions working locally on the ground function reasonably smoothly together. Compliance and enforcement will be improved in the future through formal agreements and collaborative programs with community groups and authorities that apply an innovative, cooperative enforcement approach (including an Outreach Ranger program). A program of Volunteer Inspectors is operational and could use strengthening.
- The Constitution of 1991 substantially expanded fundamental civil rights. Informal public meetings are a regular feature of MPA management, with open dialogue encouraged. Management is very accessible. Even CORALINA's General Director has weekly hours open to the community, during which time anyone can visit her office with complaints, problems, issues, etc. A conflict resolution program to support MPA management and decision-making will be developed during the new project, and training in conflict resolution will be provided to stakeholders.
- CORALINA's legal procedures are well-defined with graduated penalty structures and an education-based approach. Lawyers and managers are very accessible to the public. However, legal procedures need to be simplified and streamlined to become more efficient.
- MPA management, including enforcement, is on track to become financially self-sustainable by 2014. Meetings are underway with the Navy, Coast Guard, and US marine enforcement agencies of NOAA and the Coast Guard to strengthen joint operations, including provisioning Colombian authorities with technology and vessels. Inter-institutional enforcement agreements are being drafted, and collaborative programs are being designed to integrate stakeholders (especially artisanal fishers and watersports operators) into enforcement. Local rangers will also be trained and added to MPA staff.
- CORALINA has mapped MPA boundaries and is working with national and international institutions to incorporate the boundaries into nautical charts. CORALINA is active in regional and global networking, being part of the Caribbean MPA Regional Managers Network (CaMPAM), IUCN, UNESCO World Network of Biosphere Reserves and its regional network, and the Gulf and Caribbean Fisheries Institute (GCFI). Seaflower also has an on-going partnership with the US National Marine Sanctuary Program (NMSP).
- A strength of Seaflower's management is that CORALINA's jurisdiction includes land and sea. This allows the agency to advance a cross-sectoral approach to marine resource management, as advocated by WSSD and IUCN. CORALINA is responsible for all environmental planning, management, and education. It is also a sustainable development agency, not solely the environmental authority, allowing it to develop programs to alleviate poverty, build capacity, establish partnerships, and even enact regulations that go far beyond the usual province of MPA managers. It also places CORALINA in an excellent position to deal with conflicts and means that CORALINA regularly works with a range of other authorities at departmental, regional, and national levels.
- CORALINA is a Colombian government agency established by Congress and, as such, is subject to all national policies and requirements that pertain to government. Simply put, at the highest national level, the Constitution grants everyone the right to a healthy environment and requires that the community take part in all decisions that affect their environment (Art. 79). The people must also be formally educated about their environment, rights, and technologies to protect the environment (Art. 67). Ensuring that these things happen is the responsibility of the State. CORALINA takes these responsibilities very seriously. Therefore, MPA management and programming are deeply rooted in empowerment, capacity building, information dissemination, and consultation.

Participative incentives

- Respect for local traditions, customs, and practices, in so far as they are compatible with the fulfillment of marine biodiversity conservation obligations, was a driving factor in the development of the MPA. The MPA process emerged from the community, stakeholders led and had decision-making power in the zoning process, and the management structure is collaborative.
- Promoting equity and justice is intrinsic to CORALINA's approach but remains primarily tacit and even taken for granted. Commitment to these values needs to be formally stated, structured, and discussed. Equity, environmental justice, and a pro-poor stance must be consciously incorporated into MPA management and made explicit, being both reported and legitimized, so these values are not solely dependent on the will of a given administration or political regime, as could now be the case.
- Major issues relate to incoming users. First is the on-going in-migration of mainlanders unfamiliar with local customs and with how to live in a small island maritime environment. Second is the pressure from off-island national and international fishing fleets, both legal and illegal. These are the main issues of conflict between local stakeholders and national institutions, and neither has been successfully addressed.

  The MPA was consciously developed as an equitable way to improve marine conservation and enhance local access to benefits, partially by enabling the advance of local protectionism in these two areas, but implementation remains controversial. In regard to the first problem, in collaboration with experts and the community, CORALINA recently developed Population Policies and an Action Plan. As for the second, the Departmental Fishing Board is working on improving fisheries management, in collaboration with CORALINA and the Secretary of Fisheries. However, both issues remain highly volatile. The identification, development, and implementation of appropriate incentives to deal with them is essential for successful, long-term MPA functioning and achievement of objectives.
- Promoting pride in the MPA and the biodiversity and sustainable uses it supports is an important aspect. Activities that contribute to social sustainability include alternative livelihood pilot projects, creation of local jobs in protected area management and conservation, growth of awareness and an environmental ethic from community-wide education programs, nurturing a core of supporters, and stakeholder empowerment and MPA ownership through collaborative management, enforcement, monitoring, and research.
- As mentioned, participatory planning is central to decision-making. This is principally addressed in committee and open meetings, stakeholder workshops, training and special events, community outreach, consultations, and neighborhood programs. However, promoting transparency concerning how stakeholder participation has affected decisions, and why it may or may not have done, needs to be more formalized and structured into decision-making to ensure that stakeholders better understand how decisions are made and how seriously their input is taken by management. Dissemination of information also needs to be improved as there can be confusion in getting the message across, as well as misunderstandings of regulations, management actions, and best practices.
- 'Neutral' facilitators or panels could improve MPA effectiveness but have not been brought in. Primarily this is because no one from the continent is trusted by *raizales* to be neutral, no one from the *raizal* community is trusted by continentals to be neutral, and financial resources have not been available to bring in international facilitators, who might be accepted as neutral (although language could still be an issue). International scientific and technical partners, such as IAB members, have helped raise awareness, disseminate information, and clarify concerns. The upcoming conflict resolution program will bring in international experts to train local trainers; presumably this will help move towards a situation where neutral negotiating can be used as a tool to improve governance.

7. KEY ISSUES

Given Seaflower's holistic, integrated approach to conservation, employing incentives in all five incentive categories are critical to successful implementation and achievement of MPA objectives. To date, some types

of incentive have been addressed much more effectively than others. Ideally, the use of all five incentive categories would be equally balanced. This is not to suggest that any present incentives should be reduced but rather that the use of all incentives should be expanded in ways that tend toward a more balanced distribution and contribution of all categories of incentives.

At this time, key issues that need to be addressed to improve governance and achievement of objectives are: (i) increasing poverty and pressure on resources, (ii) lack of local management capacity and leadership, and (iii) weak enforcement. Seeking solutions to the many on-going concerns related to population and over-exploitation needs to continue. Incentives to address the key issues are a priority as follows:

To address (i), Economic Incentives should be used to strengthen alternative livelihoods and compatibility programs, especially with fishers; create local jobs in MPAs and conservation at all levels (science, management, education, outreach, technicians, promoters, affiliated fishers and divers, etc.) ensuring that local people remain the managers and scientists and that there is a qualified local pool of personnel (redistribution of power and sharing of benefits).

To address (ii), Knowledge Incentives should be continued with new incentives introduced, including seeking advanced degrees for staff (graduate, undergraduate, technical, and certificate, as appropriate), facilitating international training opportunities for staff and stakeholders, focusing on building capacity to ensure voice to the voiceless linked with establishing formal, legitimate spaces and structures to exercise voice and growing local capabilities that do not depend on CORALINA's political will or the values of a given administration.

To address (iii), Legal Incentives should be employed to strengthen enforcement and zoning regulations; develop formal participatory enforcement agreements and collaborative programs that are equitable, transparent, and involve the community in enforcement activities; formalize cooperative management; and streamline procedures and reduce bureaucracy.

Galápagos Marine Reserve
Governance Analysis

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1. CONTEXT

GDP – Ecuador: relatively low ($7500), but **average wage in the Galápagos Islands is twice that of mainland Ecuado**r, due largely to income from tourism and fishing, and probably civil service and science too.

State capacity/political will to agree and enforce restrictions is relatively low probably due to a long period of political instability as well as limited resources and infrastructure. The director of the Galápagos National Park (GNP) was appointed on a political basis, though this is now a merit-based selection process, and more than a dozen different directors were appointed between 2004 and 2007. There have been violent protests and direct actions against Galápagos National Park Service (GNPS) staff/facilities in the past as a result of proposals to initiate/enforce restrictions on fishing (see box). In 2007, the Galápagos National Park and Marine Reserve were placed on the **World Heritage Sites in Danger list**, but they were removed from the 'in danger' list in July 2010.

The Galápagos Marine Reserve (GMR) lies in the confluence of major ocean currents and this gives rise to an extremely high diversity of marine organisms, from cold water penguins and fur seals to warm water corals and hammerhead sharks, with high levels of species endemism.

2. OBJECTIVES

The Galápagos Marine Reserve was designated to integrate a vital part of the Galápagos ecosystem into the terrestrial Protected Area (Galápagos National Park designated 1959; Galápagos Marine Reserve designated in 1998), and thus provide adequate protection for the biodiversity which is dependent on both land and sea for its survival and wellbeing.

The GMR management Plan was based on the following **principles**: precautionary principle, adaptive management, participation and sustainable use.

Main management objective:

- "To protect and conserve the coastal-marine ecosystems of the archipelago and their biological diversity for the benefit of mankind, the local inhabitants, science and education."

The Management Plan details a series of 12 specific objectives below the main objective, which include **the long term conservation of marine and coastal habitats, endemic and vulnerable species, and resource species, including management actions for their recovery where necessary**; and social objectives which are fairly complex and include to:

- Support local fishers to maintain and improve their social and economic status, by ensuring fishing activities that are compatible with biodiversity conservation

- Conserve marine-coastal ecosystems as the economic basis for controlled tourism, and to prevent and mitigate any impacts caused by tourism
- Promote science aimed at understanding marine biodiversity and areas and sites affected by human activities

It also stipulates that the management must be participatory and adaptive, and establishes the need for technical information on which to base decisions.

The GNP is currently evaluating the effectiveness of the current management scheme for the GMR. This process will yield recommendations and suggestions which will later be incorporated in the new Management Plan for the GMR, due sometime in 2012.

3. DRIVERS/CONFLICTS

Tourism is the main driver of the Galápagos economy, accounting for up to 78 % of all employment, compared to less than 5% in fishing, based mainly on many small cruise liners (legally limited to <93 passengers) but the number of hotels is growing rapidly. Total **tourist numbers increased** by over 150% between 1992 and 2006. There are direct effects, through diving, snorkelling, etc, but the main effects are indirect – groundings, fuel spills, population and infrastructure growth, invasive species/pathogen introductions, etc. There is a shift from 'nature' tourism to 'adventure' tourism (kayaking, biking, etc) and this has increased both the direct and indirect impacts.

The key inter-related driving forces of conflicts between conservation and exploitation, and the means that are trying to address them are:

- population growth, from 6,000 in 1982 to around 25,000 in 2007, stimulated by tourism and fishing income opportunities: 'gold rush' or 'frontier' culture; the average income on the Galápagos islands is almost twice as high as mainland Ecuador – the Ecuadorian government has successfully implemented innovative legislation under the Galápagos Special Law that restricts immigration;
- much of the population that now live on the Galápagos islands, like many people around the world, but especially in less economically developed countries, desire a more affluent lifestyle for themselves and their children, rather than a subsistence 'sustainable livelihood' lifestyle. This is not confined to recent settlers but it is often discussed in terms of the 'mainlandisation' of the Galápagos islands and a shift away from an island culture – one of the aims of the interpretative incentives is to promote an island culture, but this is a major challenge in the face of globalisation.
- demand from Asian fish markets: fishing pressure from incoming-interloping vessels from mainland Ecuador and other countries who have a reduced long term commitment to the sustainability of fishing around the islands ('tertiary appropriators') – **access to the GMR (<40nm) is now legally restricted to local 'artisanal' vessels**.
- demand from Asian fish markets: pressure from local vessels – policy initiatives are underway to reduce the size of the Galápagos fleet (ca. 1000 registered fishers in 2008) and the effort of the remaining vessels, **but these are strongly and largely successfully resisted by fishing and politically related interests**; fishermen now have raised income expectations as a result of lucrative but unsustainable fisheries for export markets and are resistant to returning to more sustainable but less lucrative fishing. Recent reductions in demand from Asian fish markets for Galápagos fisheries, due to their low and unreliable supply rates as a result of stock collapses, is one of the reasons the GMR was removed from the World Heritage 'in danger' list. However, when the stocks recover, demand could again increase.
- incoming tourist operators: 'foreign' owned cruise vessels, hotels, etc, leading to a growing leakage of tourism income from the Galápagos economy, despite the revenue raised by entry fees, and a reduced long-term commitment by to the sustainability of tourism on the islands – there are policies to try and minimise this, such as the introduction of 'cupos' (see economic incentives), **but these have had a limited effectiveness**.

4. GOVERNANCE FRAMEWORK/APPROACH

In 1986 the marine area out to 40nm around the Galápagos Islands was designated a Marine Resource Reserve Area – essentially a paper park with no management plan, and this was met with opposition both locally and nationally from potentially affected users, as well as local politicians that saw this affecting their constituents. In 1996 the area was designated a Biological Reserve but this led to protests (see box). The problems caused by this previous 'top-down' governance approach led to the designation of the GMR in 1998 under the Galápagos Special Law, with the emphasis on a more participatory approach through a more devolved governance process:

Participatory Management Board (PMB) - made up of local representatives of the Tourism, Naturalist Guide and Fishing Sectors, the GNPS and the Charles Darwin Foundation. In 2008, the Science, Conservation and Education Sector was formed and it is expected that this sector will be given a vote at the PMB when the Charles Darwin Foundation (CDF) relinquishes its vote in order to play a purely advisory role, during the next revision of the Special Law. The PMB generally meets on a monthly basis and **aims to agree management proposals on consensus basis**. The PMB has mostly focused on resolving fishing issues, which has resulted in confrontations with the local fishing groups, who in turn have developed stronger bonds with mainland politicians in order to achieve what they need and want. The tourism and naturalist guides sectors are part of the meetings but in order to avoid conflicts with fishermen, they normally back unsustainable decisions that benefit the fishing sector, which leaves CDF as the sole opponent to a consensus.

Inter-Institutional Management Authority (IMA) - maximum decision making body of the GMR. It is presided over by the Minister of Environment, and composed of three additional ministries: Tourism, Fishing and Defence. The local fishing sector, the local tourism sector, and environmental NGOs also each have a representative. Both CDF and GNPS play advisory roles on the IMA. Generally, it will ratify a consensus from the PMB, but where the PMB has been unable to reach a consensus the IMA will make a decision by majority vote. All decisions taken in the PMB are then taken to the IMA in order to get a Resolution passed that will enable the activity. Normally all decisions taken by consensus are ratified by the IMA, however when a decision arrives without consensus, the IMA will decide on them with a voting system. Despite the conservation objectives in the GMR Management Plan, not all decisions that arrive to both PMB and IMA are conservation orientated, and generally the final decision is taken based on socio-economical and political interests rather than those using precautionary principle or the intrinsic value of conserving the islands.

The GNPS issued proposals in 2003 that would further regulate fishing by the domestic fleet, following four years of negotiations amongst PMB and IAM members, including with fishing representatives, presumably due to socio-economic and political pressure exerted by local and mainland Ecuador interest groups. Objections to the proposed regulations led to the seizure and blockade by fishermen of the Charles Darwin Research Station and the premises of the GNPS. They made several demands and the Ecuadorian government subsequently agreed to:-

- form a committee to review all existing and proposed fisheries regulations, including the ban on long-line fishing;
- examine whether charges against some recently prosecuted fishermen should be dropped;
- ensure prioritisation of fishermen in opportunities to enter the tourism sector;
- provide a line of credit to the artisanal fishing sector to move into tourism as well as other fishing activities

The CDF, which provides scientific advice to the GNPS through its research at the Charles Darwin Research Station, was invited to provide a technical response to the above agreement, but neither the CDF nor the GNPS were represented in the negotiations that led to it. The Environment Minister, who brokered the agreement and was to chair the review committee, resigned very shortly after this agreement, citing personal reasons, but others have speculated that his position became untenable, as he was under intense pressure to strengthen, not weaken, protective regulations, particularly from UNESCO, who subsequently placed the GMR on the 'World

Heritage in Danger' list. The fishing sector were considered by some to be following the lead of large tourism companies, which had worked outside the participatory channels to revise the regulatory framework to benefit tourism.

Previous protests against existing and proposed restrictions on fisheries exploitation in the GMR have included threats by fishermen to release goats onto islands that had been cleared through years of eradication efforts (2004), major riots, that were only quelled after several days by the intervention of armed military personnel sent from mainland Ecuador (2000), the shooting of a park official (1997) and fishermen holding GNPS wardens hostage and threatening to burn parts of the national park and kill rare tortoises, including old lonesome George, the last remaining member of the Pinta sub-species (1995) [MPA News **5**(8), 4-5, July 2008; MPA News **2**(6), 1-3, December 2000; New Scientist 27/11/04, 6-7; New Scientist 16/9/95, 6].

5. EFFECTIVENESS

Enforcement at sea is carried out in conjunction with the Navy but conflicts between the Navy and the GNPS over the control of the GMR have led to breaches of enforcement capacity, often at key times, e.g. sea cucumber harvesting season. This aside, given the vast area of the GMR (140,000 km^2), enforcement is a major challenge and a VMS system has been developed to aid this, and has now been implemented. The VMS led to the finding of few illegal industrial fishing vessels, which are now awaiting an official response on their future. Automatic Information System (AIS) for vessels less than 20 tonnes is also being implemented.

No comprehensive assessment of status and trends in relation to biodiversity and resource conservation objectives has been undertaken, and a 'baseline' assessment was not undertaken until 2002.

Apex fish/shark populations (migratory pelagics) have had local pressures on them reduced through the ban on incoming vessels and the ban on local vessels on long-lining/'industrial fishing' within 40nm. However, despite this ban on industrial fishing from mainland Ecuador and other countries, certain industrial fishing methods, e.g. longlining, are still being illegally used by the local the 'artisanal' fishing fleet as well as incoming illegal fishing vessels. The impacts on the pelagic fish populations of this attempted restriction to local vessels and the ban on industrial fishing vessels are unknown. Recognising that Galápagos fishermen are calling for long-lining by them (but not outside vessels) to be permitted, and that there are still reports of incoming fishing vessels, it seems likely that the ban could be being breached by both local and incoming vessels.

Only 6% of the GMR is designated solely for conservation, whilst 11% is designated for tourism, in which extractive activities are banned. Many populations have essentially crashed (<10% of recorded highs), particularly groupers, lobsters and sea cucumbers (benthic invertebrates/territorial fish species). Even when they are 'bumping along the bottom' and CPUE is relatively low, it remains commercially profitable to continue to exploit these stocks, due mainly to external demand from Asian markets, but the **total value of catches declined** from around $7 million in 2003 to less than $3 million in 2008 showing the decrease in landings. The sea cucumber fishery, once the most lucrative fishing activity in the GMR, has now been closed for the past three years (2008, 2009 and 2010) due to the low population densities. Average densities have not reached the consensus threshold value (11 sea cucumbers/100 m^2) but have ranged between 3 and 9 sea cucumbers/m^2. The yield from the spiny lobster fishery has also shown drastic decreases, although fishermen blame the low catches on the lack of a good market scheme and low prices.

On the whole it would appear that key aim of using the precautionary principle and ensuring sustainable use is not being fulfilled, and that other than some migratory pelagic species, exploited populations and wider biodiversity are in a state of decline if they have not already 'bottomed-out', rather than recovering. The main management objective 'to protect and conserve the coastal-marine ecosystems of the archipelago and their biological diversity' is not therefore being fulfilled.

6. INCENTIVES

Some examples are given in the next section in terms of incentives that have been focused on and the options

for improving governance.

7. KEY ISSUES

It is debatable whether it was the top-down nature of the Biological Reserve proposals that led to the protests/non-compliance (see box) or the fact that restrictions on use were being proposed. In the light of these experiences, the GMR is governed through an approach that provides for the participation of users through representatives of the fishing and tourism industries, along with other environmental representatives. The key problem, however, is that the user representatives on the PMB are lobbied by their constituents (fishermen and tourism operators) who are, in turn, influenced by external forces, by being lobbied by representatives of international tourism and fish markets or economically influenced by these markets. This, coupled with the understandable priority of many local people to increase their economic well-being, has led to a participatory governance system that routinely blocks proposals to restrict economic development activities (reduced MLSs/quotas, reducing numbers of tourist/fishing vessels, etc). Consensus on such proposals is never reached by the PMB and environmental representatives now routinely pass such proposals to the IMA. This higher level decision-making platform is, however, subject to influences from users and related external forces, through the lobbying of ministers and deals for votes in return for vetoing such proposals. Even where such proposals are agreed through the role of the IMA, protests and direct actions often lead to them subsequently being withdrawn or users ignore them, enforcement capacity being limited and the process for prosecuting transgressors under civil law being slow and weak.

It is therefore understandable that only 6% of the GMR is set aside solely for conservation (though the 11% set-aside for tourism should also be protected from commercial fishing) and that this and other use restrictions on fishing and, to a lesser degree, tourism have been relatively ineffective in reversing declines in fish stocks and wider marine biodiversity. **So what is the way forward in terms of improving governance?**

The authors of the report, several of whom have extensive experience working with the GMR, argue that **economic incentives** for supporting facilitation, compatible developments, adding-value to seafood products, etc **have been largely ineffective,** serving only to create situations of dependency on NGO funding. The potential for the green marketing of tourism and fish products is declining as the conservation status of fish populations and wider biodiversity declines, and market demand for both seems to be so large as to be a driving force of depletions, so it could be argued that the potential for green marketing to boost demand and profitability through green premiums is very limited.

Increasing the **knowledge** base to justify restrictions would arguably have little impact, as users potentially affected by such restrictions will simply reject the scientific evidence as will the other exploitation-related vested interests. The scientific case that fish populations and wider marine biodiversity is severely depleted already arguably has relatively low degrees of uncertainty associated with it, but the scientific case for restrictions is still routinely rejected or ignored by users in their efforts to resist such restrictions. One of the key arguments against the case that depletions are caused by overfishing, tourism impacts, etc is that natural oceanic variations, such as El Niño events, perhaps exacerbated by wide-scale climate change, are the cause of depletions. Whilst the precautionary principle, which would place the burden of proof on fishermen/tourism operators to prove that overfishing/tourism is *not* the cause of depletions, with restrictions being applied until this had been proved, is a key principle for the GMR under the Galápagos Special Law, it is not applied in reality. The GMR is not alone in its failure to actually employ the precautionary principle in decision-making processes, due to the negative impacts this would be likely to have on users of marine ecosystems, given the relatively high degrees complexity and uncertainty associated with such ecosystems. Whilst increasing the knowledge base to support proposed restrictions will improve the potential for effective governance, exploitation-related vested interests will still tend to challenge, reject and ignore such evidence.

The political reality is that the capacity for stricter **legal** protection through more top-down decision-making processes and stricter enforcement is limited, due to political instability and a lack of political will to alienate the Galápagos Islands' population (their voters), whose relatively good economic status (twice the per capita GDP of mainland Ecuador) is largely attributable to the growth of tourism and, to a lesser degree, fishing to supply lucrative external markets. Tourism remains subject to external pressures for growth/intensification and

the domestic fishing capacity appears to be sufficient to prevent or reduce recovery in fish populations and wider biodiversity. **If the same political will that addressed the pressures from population growth and incoming-interloping fishing vessels could be generated and applied to address the pressures from tourism and domestic fishing, restoration of the conservation status of the GMR could be feasible**. It could, however, be argued that addressing the incoming pressures positively affected Galápagos people, as it served to protect them from 'outsiders' and thereby economically benefit them, and therefore also politically benefited the regulators and politicians. Initiatives to address the pressures from tourism and domestic fishing, by contrast, would negatively affect Galápagos people, at least in the short term, so the political will to address these pressures is likely to be very much less.

The authors note that the GNPS has the **legal powers** under the GMR legislation to prevent the PMB from ignoring scientific advice and taking (in)decisions that undermine the GMR's conservation objectives, and recommend that **stronger leadership from the GNP and related state authorities is required in this respect**. Past attempts by the GNPS to use their powers to control/restrict fishing have led to protests, direct actions against GNPS staff/facilities, riots, etc (see box), so it is understandable that there have been reservations in using these powers and that there will continue to be so, even with the 'encouragement' of UNESCO's World Heritage Committee, CBD, conservation NGOs, etc. The political instability of the Ecuadorian government is a key factor in this reluctance, as it increases the potential both for users of the GMR to lobby and even bribe politicians, in return for votes, for the withdrawal of actual or threatened direct actions, etc and also for people with their own political agenda to inflame objections and protests from GMR users. However, such an understandable reluctance, coupled with the lack of enforcement capacity, contributes to the undermining of the legitimacy/credibility of the GNPS and a 'downward spiral', whereby even those who might otherwise cooperate with restrictions on use in the GMR are less likely to when they see such restrictions being blocked or ignored by other users, even if these users are in the minority and are recent 'incomers'. This is **arguably the weakest element of the GMR governance approach that critically undermines the potential effectiveness of all the other elements**. If a 'freeriding' minority of fishermen, be they 'rogue' locals, recent settlers or incomers, can block proposed restrictions through actual or threatened direct action and/or simply ignore such restrictions, it is reasonable that other users will elect not to exercise restraint and cooperate with use restrictions, as any benefits that might accrue to cooperators through the recovery of fish populations and marine ecosystems will be undermined, if not completely negated, by the impacts of the freeriding minority. The same is also the case with tourism operators.

A great deal of effort has been focused on a combination of **participative** (PMB/IMA, NGO funding to support representative deliberations, etc) and **interpretative** (focusing international attention, initiatives to raise the awareness of Galápagos population, etc) incentives. The GMR's governance approach has been evaluated and was found to be performing well in some respects (strategic vision, participation, empowerment, consensus orientation and resilience) but less well in others (responsible representation, equity and credibility). It must, however, also be noted that the GMR's **governance approach is not performing well in terms of it's effectiveness in providing for the fulfillment of fisheries and biodiversity conservation objectives**.

In order to address this, the authors of the report conclude that the **focus should be on strengthening the participatory governance approach by focusing on the development of participative incentives**, drawing on common-pool resource (CPR) governance research, coupled with **stronger leadership from the GNP and related state authorities, including strong legal incentives, to resist the perturbing effects of driving forces (tourism, fishing, etc) and prevent local and incoming 'freeriders' from undermining collective agreements**. It is important to note, however, that whilst one of the key enabling conditions identified by CPR researchers is that the state should shift from controller to facilitator, in the case of the GMR this is arguably not realistic, as the state must arguably exercise some control in order to (a) prevent local and incoming freeriders from undermining collective agreements and thereby the fulfillment of GMR conservation objectives; and (b) to ensure that wider-scale, longer-term strategic biodiversity conservation and restoration objectives are achieved, rather than GMR governance focusing solely on sustainable use. The conclusion that both participative and legal incentives should be promoted and strengthened may thus appear to be a contradiction from a CPR perspective, but as is argued in Volume 1 of this report, the emphasis must be on combining the role of all five categories of incentives (economic, interpretative, knowledge, legal and participative) rather than focusing just on particular categories of incentives. Legal incentives are arguably essential to reinforce the

GMR governance framework, in combination with the cementing role of the other four categories of incentives.

Against the background of these conclusions, one of the priorities is to promote an island culture rather than the present 'gold rush' frontier culture, though interpretative incentives, including programmes to promote awareness of sustainability issues amongst users and educational programmes to increase the potential for consensus to be reached[25], recognising that school children are future PMB/IMA members and users of the GMR. It is debatable, however, whether this is feasible, in that it is widely recognised that the values and priorities instilled at school often become displaced during adolescence and adulthood, as other material and family priorities become important. Given the relatively low economic status of the people of the Galápagos Islands, it is doubtful whether the understandable desire for economic development can be overcome amongst all members of present and future user communities by such interpretative approaches. It is also debatable whether such an approach is feasible given that heterogeneity and plurality are inherent in most, if not all, modern societies, and that the governance aim of achieving consensus amongst PAMB members and the users they represent is not realistic.

The arguments above support the general proposal of this project that effective MPA governance can usually only be achieved through a **combination of governance approaches** employing a range of incentives from all five categories, the following being general illustrative examples on which there are further details in the incentives section of the main analysis:-

Economic

Maximising internal benefits by minimising the leakage of income from tourism and fishing away from the people of the Galápagos islands.

Promoting the equitable distribution of income amongst different groups.

Utilising property rights allocations, such as the cupos, but also ensuring that the conditions attached to these, e.g. not rented to foreign-owned cruise vessels, are complied with through legally enforcement of such conditions and the withdrawal of property rights from transgressors.

Knowledge

Continuing to improve the socio-economic and ecological knowledge base to support decision-making processes, drawing on both scientific and local knowledge and promoting collective learning.

Establishing rules and procedures for implementing and operationalising the precautionary principle, recognising that there will always be a degree of uncertainty, the use of which to delay or reject decisions should be minimised.

Interpretative

Continuing to increase awareness of conservation issues, priorities and successes to promote pride in and ownership of the GMR through various media.

Participative

Improving representation of all key stakeholder groups (direct and indirect users);

Recognising the need for 'tempered' facilitation that steers deliberations in an instrumental manner such that is most likely to provide for the fulfillment of conservation objectives. Transparency and accountability are particularly important in this respect.

[25] Developing the capacity to build consensus is consistent with the new sustainable development strategy agreed between CDF and UNESCO and the new conservation and sustainable development strategy agreed between CDF and the Isabela municipal government.

Legal

Ensuring that the 'rogue freeriding' minority cannot block decisions, ignore decisions or have them revised through threats of direct action or actually carrying out direct action.

Attaching legally enforceable performance conditions to property rights attached to tourism and fishing resources, failure to fulfill which leads to the forfeiture of the property rights.

Ensuring sufficient enforcement capacity, e.g. employing VMS to ensure the ban on incoming vessels is complied with; making it a criminal offence to breach GMR restrictions (currently civil offence).

Utilising the legal powers available to the GNPS to prevent the PMB from ignoring scientific advice and taking (in) decisions the undermine conservation objectives.

An emphasis solely on participative approaches through decisions based on consensus is arguably not a realistic approach for decision-making in a heterogeneous, dynamic and pluralistic societal context, no matter how much education towards this ideal is instilled in people. **A combination of governance approaches is needed but it is argued that any combination of economic, knowledge, interpretative and participative incentives will have very limited, if any, effectiveness in achieving the conservation objectives of the GMR unless stronger legal incentives are in place**. A 'downward spiral' is extremely likely, through the undermining of legitimacy and credibility, if a rogue freeriding minority is allowed to block, ignore and/or overturn decisions that restrict economic development opportunities, even if these opportunities are considered to be unsustainable. It may be that the political will to enforce legal incentives can be promoted through international pressures and support from the World Heritage Committee, CBD, etc. The strengthening of state capacity to enforce GMR restrictions could be argued to be politically unrealistic, but if legal incentives are adopted in combination with the other incentives, the synergistic benefits generated by them could help overcome political hurdles to increase state capacity. The downward spiral in both cooperation and effectiveness must be broken if the GMR is to improve the prospects for fulfilling its conservation objectives, and it is argued that **developing legal incentives and providing for more state control is an essential component of the combined incentives approach**.

The Karimunjawa Marine National Park
Governance Analysis

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1. CONTEXT

Name: **Karimunjawa National Park (KNP)**
Size of MPA: 1,106.25 km^2
Coastline length (where applicable): 120 km
Distance from shore: 40km: Group of 22 islands with intertidal and subtidal habitats

Table 1. Economic and political data for Indonesia and Karimunjawa National Park (KNP).

	National (2008 estimates)	**Karimunjawa** (2008 estimates)
Population per km^2	20.2 ind/km^2	125.1
Population growth rate	1.49 (2000)	1.136%
Per capita GDP (US$)	1582	3,900 (domestic)
GDP growth rate	6.1% (2008)	6.1%
GDP composition by sector	Agriculture 14.4% Mining 11% Processing Industry (incl. Fisheries) 27.9% Energy and Water 0.8% Building Infrastructure 8.5% Trading and hospitality 14% Transport and communications 6.3% Finance and financial services 7.4% Other Services 9.8%	Agriculture 13.5% Industry (incl. Fisheries): 45.6% Service 40.8% (2005 est.)
Labour force by occupation	Agriculture 41.2% Mining 1.1% Processing Industry (incl. Fisheries) 12.1% Energy and Water 0.2% Building Infrastructure 4.4% Trading and hospitality 20.9% Transport and communications 5.7% Finance and financial services 1.4% Other Services 13.0%	Agriculture 42.1% Industry 18.6% Service 39.3% (2005 est.)

Unemployment rate (2008)	8.4%	8.4%
Government type	Democratic Republic	Democratic Republic

Karimunjawa National Park (KNP) is located about 75 km off central Java's northern coast in western Indonesia within the sub-district of Kecamatan Karimunjawa, under Jepara Regency, central Java province (Figure 1). The Karimunjawa sub-district comprises 27 islands divided into 3 villages: Karimunjawa, Kemujan and Parang. Four islands are inhabited - Karimunjawa, Kemujan, Parang, and Nyamuk island.

The estimated population in Karimunjawa sub-district in 2008 was 8,842 people. The dominant ethnic groups are Javanese, Madurese, Buginese, and Mandarese, and the dominant religion is Muslim. Fishing is the main livelihood practiced by over half the population, with farming practiced by others. The fishers mainly fish during the dry season and catch fish throughout much of the park. The education level of the population is low for the area with most having not completed elementary school.

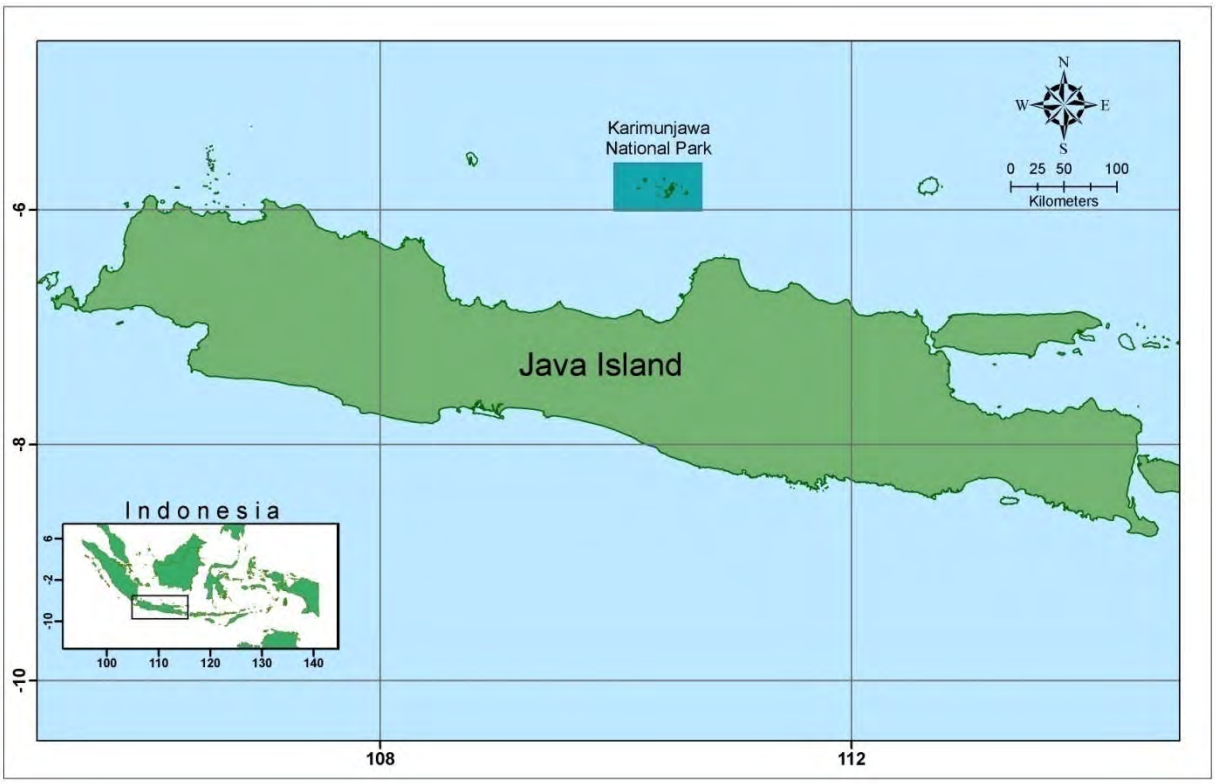


Figure 1. The location of the Karimunjawa National Park.

2. OBJECTIVES

The Karimunjawa Islands were among the first areas recognized in Indonesia as important for conservation and marine biodiversity protection.

It was formally declared a Strict Natural Reserve in April 1986 under a Ministry of Forestry (MOF) Decree No. 123/Kpts-II/1986) and in 1988, was declared as Karimunjawa National Park (KNP). In 1999 a zonation plan was released covering 1,116.25 km^2. The sea covers 1,101.17 km^2, while the lowland tropical forest covers 12.86 km^2 and the mangrove forest, almost 3 km^2**.**

The KNP Management Plan (2005-2010) outlines the primary management objectives:

- To protect biodiversity, ecosystems and resources for sustainable use and livelihoods;
- To preserve natural marine and terrestrial species;
- To provide effective management for community prosperity and national obligations.

The KNP is managed accordance to national and provincial laws and regulations:

Law on Conservation of Natural Resources and Ecosystems of Indonesia (UU5/1990): this is the most important regulation for national nature parks and reserves (both terrestrial and marine) in Indonesia. Key aspects are:

1) *Conservation* in the establishment and management of national parks and nature reserves, the conservation of biodiversity managed in accordance with sustainable use, economic development and the livelihood needs of inhabitants.
2) *National park reserve zoning scheme:* the laws address biodiversity objectives and local economic needs through a zoning scheme allowing for natural resource extraction (eg. fishing and collection of living and non-living resources). The zones are divided into core, protection, tourism, mariculture, rehabilitation and inhabitant zones. Regulations for each zone are explained in Table 2.
3) *Responsibilities of central and local governments:* National parks and nature reserves designated by the national government are financed and managed by central government agencies on site. District level governments also have management responsibility for the areas.
4) *Regulations on compatible economic activities:* All extractive, tourism and other compatible activities within national parks and reserves must not conflict with the conservation objectives of nature parks and reserves and must seek permission from the National Park Authority and central government agency in charge of administration.

Law on Fisheries of Indonesia (UU31/2004) is the most important national law on fisheries in Indonesia and applies to all marine, brackish and freshwaters. Key aspects include:

1. *Conservation and sustainable use of fisheries resources:* the primary objective of this law is to conserve fisheries stocks while allowing for sustainable use of fisheries stocks.

2. *Fisheries controls:* The designation of allowable fisheries uses with controls on gear use and other controls on fishing effort and spatial closures is a primary objective that allows for continued economic benefits to communities while protecting fishery resources through bans on destructive fishing practices.

Law on Management of Coastal Areas and Small Islands (UU27/2007) is the most important law pertaining to designation of marine protected areas outside national parks and reserves and applies

to waters up to 12 nm out from the coast and the land and waters of coastal municipalities. This law is relevant to district and provincial level government agencies. Key aspects include:

1. Conservation of species and ecosystems: high level protection for marine species and ecosystems through designation of marine protected areas and other controls on human use. Key habitats and species comprising coral reefs, seagrass meadows, fish spawning aggregation sites, mangroves, cetaceans, bird nesting areas, turtle nesting sites and economically valuable marine species are identified as priorities in the management plan.

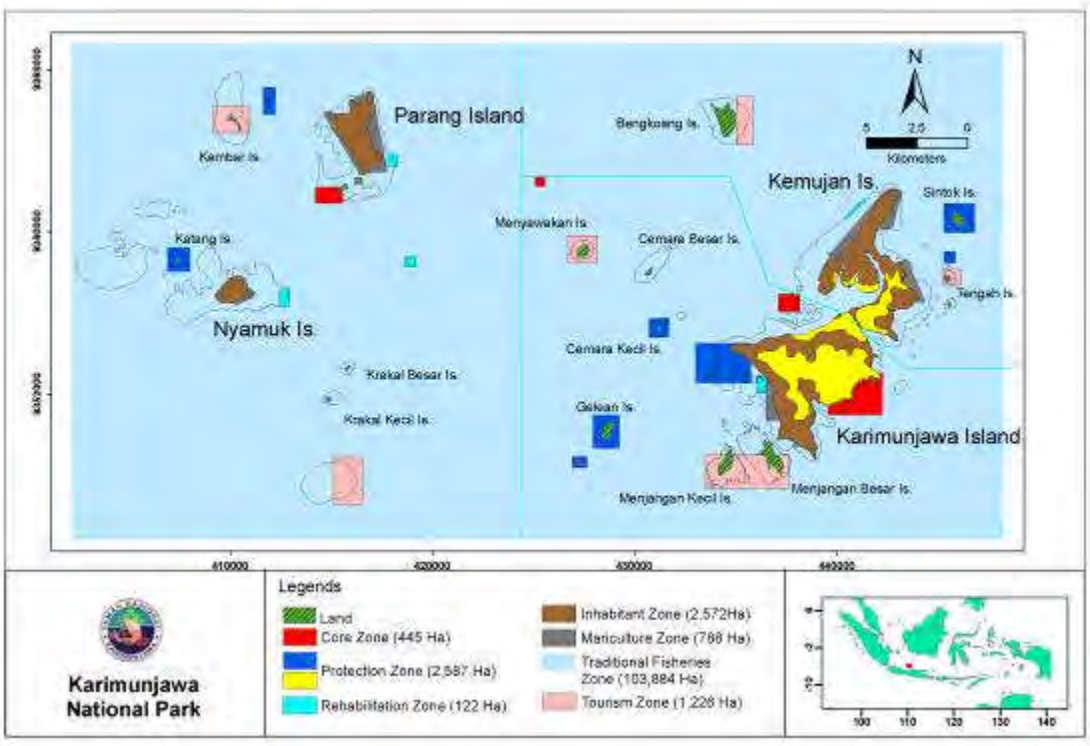
2. Biodiversity conservation and sustainable use: policies are in place to protect biodiversity while allowing for sustainable use of resources.

3. Protection of religious and cultural assets: The protection of religious assets such as temples and cultural assets such as shipwrecks and traditional management systems.

The park consists of both the terrestrial and the marine components. The sea covers 1,101.17 km^2, while the lowland tropical forest covers 12.86 km^2 and the mangrove forest, almost 3 km^2**.** The zoning plan for KNP provides the basis for the regulation of activities within the KNP (Fig. 2 and Table 2). The park zonation was finalized in 1999, but was evaluated and amended between 2003 and 2005. Legislation of the new zones occurred in August 2005 (Fig. 2, Table 2). The rezoning gave opportunity for all stakeholders to help define KNP management policies. Consultative meetings fostered communication and commitment to park zoning among all stakeholders. Ecological, fisheries use and socioeconomic data served a basis for planning and designing of the zones.

Table 2. The different zones, area of each zone, percentage of each zone of the total area and in brackets of critical marine habitats and the activities allowed per zone.

Zone	Area (ha)	Percentage (%)	Activities allowed in the zone (no fishing, tourism only etc)
Core	444.6	0.4 (2.7)	No take zone: scientific research, education, monitoring, patrolling allowed.
Protection	2,587.2 (including terrestrial)	2.3 (7.0)	Protected zone: for land areas these are lowland forest and mangrove ecosystems of Karimunjawa Island Research, education, monitoring, patrolling and limited exploitation activities are allowed with permits. Activities allowed in this zone include limited tourism activities and education. The National Park Authority conducts patrols every month in this zone.
Tourism	1226.5	1.1 (9.7)	Developing infrastructure for tourism with special permit.
Rehabilitation	122.0	0.1	Rehabilitation zone: these are areas with coral cover less than 25%. The zone is for the restoration of coral reefs. National Park Authority develop artificial reef to restore reef condition in this zone.
Mariculture	788	0.7 (7.5)	Mariculture: seaweed and fish mariculture.
Traditional Fisheries	103,884.4	93.1 (73.1)	All non-damaging traditional fishing gears permitted.
Inhabitant zone	2,572	2.30	Zone for community housing



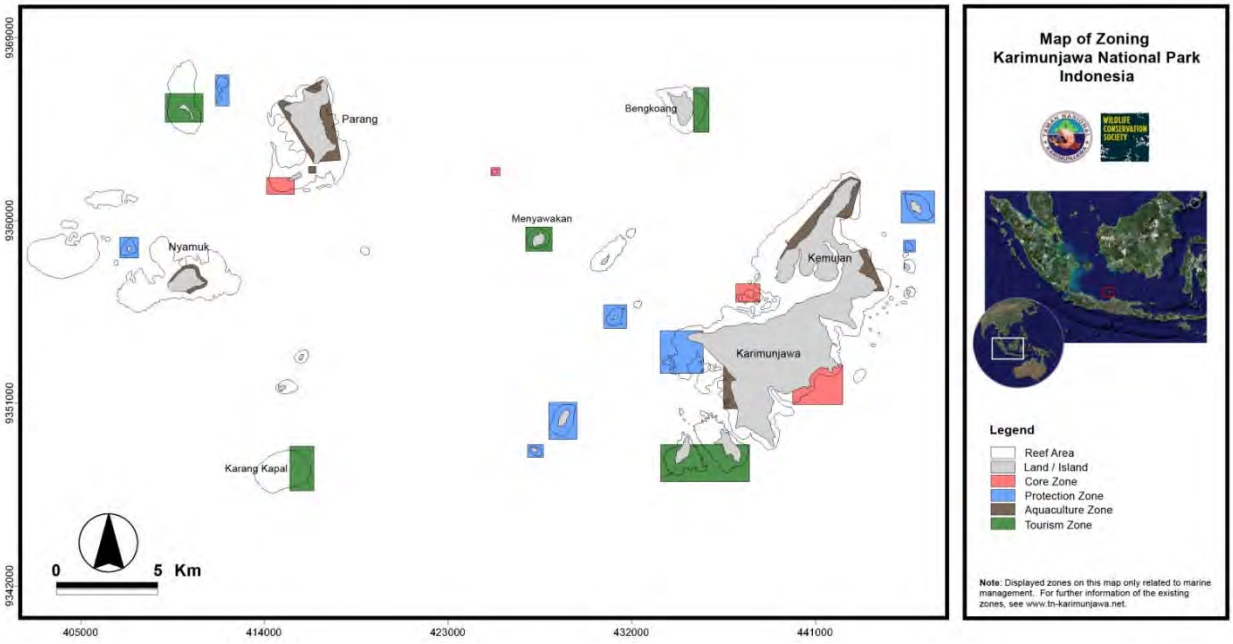


Figure 2. Karimunjawa National Park management zones.

3. DRIVERS/CONFLICTS

The main threats to biodiversity conservation within the KNP are large and small-scale fishing, water pollution from infrastructure and mariculture development and uncontrolled tourism.

3.4. The impacts and drivers of large and small-scale fishing

Fishing is the most common activity in the KNP with 70% of the local community involved in fishing related activities. Fisheries resources have declined over the past 20 years and mariculture activities have expanded 20 fold or more over the past 6 years. Although destructive fishing practices including cyanide fishing and the use of illegal fishing gears are prohibited by park regulations they are still practiced inside the national park and within the no-take zones. Common fishing gears used in the KNP include muroami nets (see Tomascik et al. 1997), gill nets, hook-and-line, and fish traps. The number of muroami fleets numbered 18 in 2003 and this has declined to 1 fleet in 2009, most likely due to external economic pressures, a decline in catches and possibly some enforcement pressure from the marine park authority. Coral reef surveys within the KNP from 2003 until 2009 have shown that coral reefs are recovering from past destructive fishing practices. However around ten per cent of fishers still use destructive fishing methods including cyanide and muroami fishing and in the last six months 250 boats still fished in protected and core zones. Management zones are therefore not well acknowledged by all fishers, though many fishers perceive a decline in catches (WCS data), reflecting their knowledge of the area and an increasing understanding of the effects of overfishing and destructive fishing.

The biomass of reef fish has relatively stabilised since new zoning regulations have been in place (Ardiwijawa et al. 2008) although the density and size of species of high commercial value are low, indicating heavy fishing pressure (Campbell and Pardede 2006). The low biomass of highly valued large reef fish should improve with stakeholder compliance with zoning regulations which is around 90% in core zones but lower in protection zones (~70%). Community involvement and decentralization laws in Indonesia are considered main drivers to improving the biodiversity of the KNP because they can solicit more active involvement of district and local governments in the management of the park.

The live reef supply network that extends across the Indo-Pacific (Muldoon and Johnston, 2006) created demand for live reef fish (eg. Serranidae), caught mainly using cyanide, in Karimunjawa. The demand came from Hong Kong markets from 2000 to 2005, with around 2500 kg caught per annum, mostly from the wild. In 2009 the domestic market centred in Java has been the primary driver for live reef fish with boats collecting up to 1151 kg from mariculture and 1104 kg of wild caught species in 2009. The highly valued napoleon wrasse (*Cheilinus undulatus*) is protected under national law, and is generally not fished or exported to external markets.

3.5. The impacts and drivers of tourism

Tourism has increased over the past 6 years in Karimunjawa from around 200 visitors in 2003 to a peak of over 8000 in 2005 and over 4000 tourists in 2008 (Fig. 3). Although the percentage of people involved in the tourism industry remains at relatively low levels (~1.5%), tourism can impact coral reef ecosystems through anchor damage and trampling. Tourism is driven mainly by the growing domestic and regional tourism market, with foreign tourists accounting for less than 10% of the total tourist volume. Tourism aims to facilitate sightseeing, promote educational tourism (sea turtle, mangrove, lowland forest) and encourage diving and snorkelling, tour guiding, home stays and local resorts. This has resulted in new buildings and resorts for accommodation and the increased use of boats for tourists. Tourism is also affected by political events and global economic factors. Tourism impacts in the KNP are likely to increase in the future if management zones that accommodate village infrastructure development and tourism based activities in marine waters (9.7 % of critical marine habitats) are not adhered to. The impacts from water pollution from sewage are likely to increase in the future, as economic development accelerates in Karimunjawa.

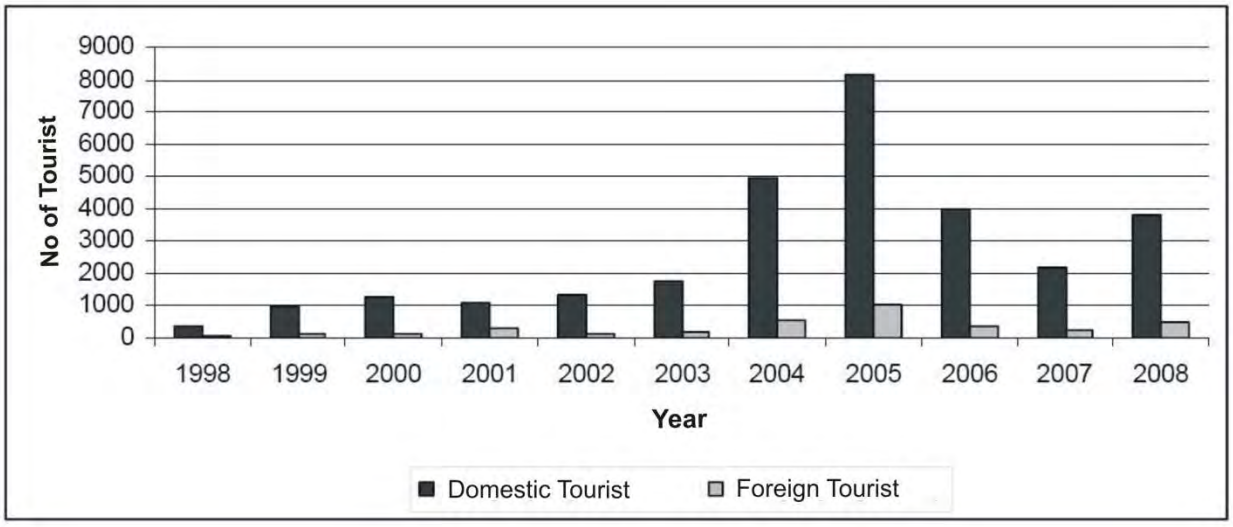


Fig. 3 Tourism in the KNP from 1998 to 2008.

3.6. The impacts and drivers of water pollution

Impacts from coastal development, including the construction of hotels and new village infrastructure in the KNP have increased in recent years. Such developments often have inadequate sewage control systems and nearshore marine areas may be impacted by sewage run off. The use of cyanide to catch high valued reef fish contributes to water pollution and coral habitat mortality. Since 2008 an increased awareness by local communities of the detrimental consequences of destructive fishing has reduced destructive fishing practices. This need for economic alternatives has led to the expansion of mariculture facilities in nearshore waters, driven by a large domestic demand for seaweed, clam and reef fish. These facilities can pollute marine waters, through inputs of organic nitrogen from fish and seaweeds, causing anoxic conditions and mortality of benthic habitats. Mariculture zones as part of the KNP zoning aims to manage, control and limit these impacts.

4. GOVERNANCE FRAMEWORK/APPROACH

The KNP is managed by the Karimunjawa National Park Authority (KNPA) of the Ministry of Forestry (MOF). The KNP is a National Park under category 2 of the IUCN categories for marine protected areas.

The KNPA is a central government authority that provides financing and management of national parks and reserves. The KNPA manages the park with some autonomy at the site level. The KNPA has the primary management role although district government agencies concerned with fisheries, tourism and development have responsibilities and jurisdiction of activities in the National Park. The stakeholders involved in governance of KNP are detailed in Fig 4.

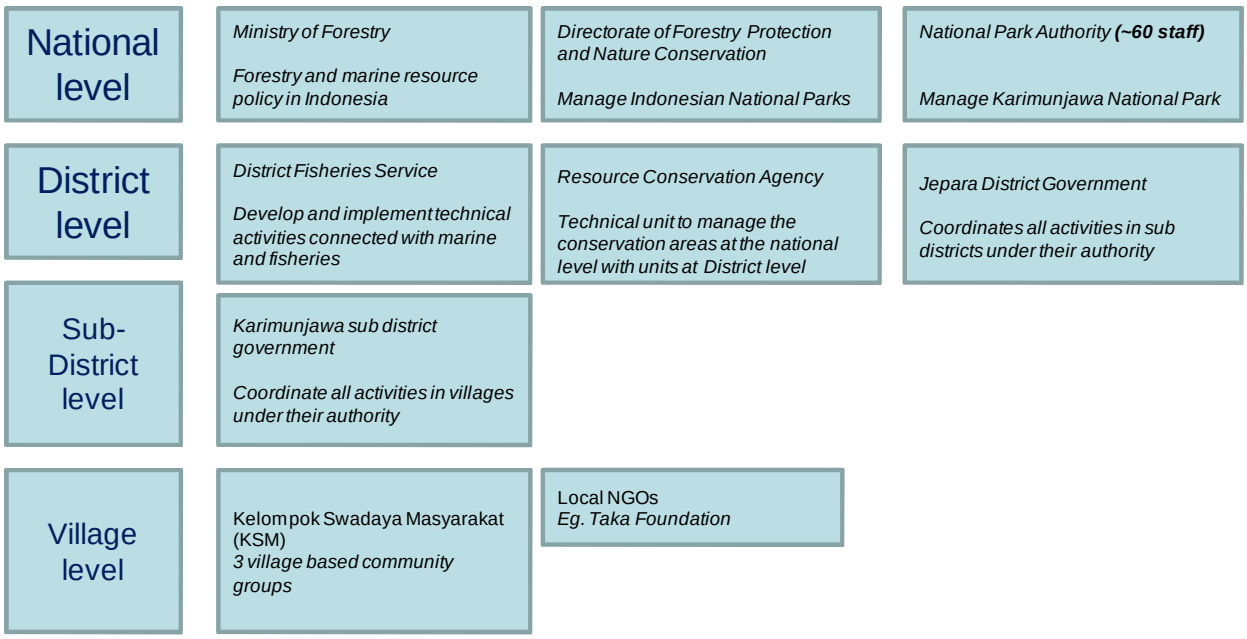


Figure 4. Governance structure of the KNP.

The KNPA requires support from local communities and the local government agencies to manage KNP effectively. Under UU No.5/1990 a Government Regulation (Peraturan Pemerintah/PP) No. 68/1999 is a technical regulation for conservation area management. In this regulation there is no obligation for other parties to fulfill KNP objectives. But there is an obligation of the KNPA to encourage other parties (eg. Fisheries, NGOs, business sector) to assist in fulfilling KNP objectives. Additionally, Ministry of Forestry Regulation concerns collaborative management and endorses National Park Authorities to develop collaborative management. A collaborative management forum initiated in 2007 aims to align district government policies and activities with those of the national park, as often fisheries and tourism policies contravene national park regulations. For example while muroami and cyanide fishing is banned by national policies, district fisheries governments have allowed muroami use and the KNPA were ineffective in controlling destructive fishing. This can be attributed to ambiguous legislation which provides a poor legislative basis at the district level, where district fisheries laws permit muroami despite national prohibitions. The KNPA therefore have no legislative basis to enforce national laws as they have no jurisdiction over district fisheries authorities. District fisheries agencies have also benefited financially from the uncontrolled take of live reef fish, through regulating the trade at the point of sale in the Karimunjawa Islands. In recognition of the weak enforcement capacity of KNPA, due to a lack of resources, other stakeholders are now engaged in assisting management of the KNP with the collaborative forum improving communication among government agencies and communities in both the tourism and fisheries sectors. An example is that the KNPA have focused on community-oriented initiatives to provide alternative livelihoods such as mariculture, training in community based enforcement activities and the raising of local awareness for coral reef conservation.

5. EFFECTIVENESS

- Community/user rights recognised in zoning

The new zoning plan legislated in August 2005 recognises user rights for tourism, mariculture and fishing

within the KNP. It provides incentives to better manage resource use through areas of exclusive use for mariculture of seaweed, clams and fish. Fishers have been able to switch occupations from fishing to mariculture and take advantage of existing market demands for these products. Government agencies and NGO's are working to ensure these practices are maintained sustainably through development of business plans and monitoring of the impacts of mariculture to limit damage to marine ecosystems.

- Promoting economically and ecologically sustainable resource exploitation

The KNPA has designed and implemented the new zonation rules which allows for traditional fishing use in 83% of the KNP. Government agencies have worked with communities to promote sustainable fisheries which has increased compliance within no-take zones from 88% in 2004 to 94% in 2009. Compliance in protected zones has consequently decreased from 87% to 73% as fishers have less awareness of the fishing restrictions in these zones. An increased community acceptance of refugia for marine organisms in conservation zones will assist aims of the Park Authority to enhance harvests in fishing grounds through spill-over/export, provide insurance against uncertainty and increase coral reef resilience to climate change. These aims are continually threatened by poaching by fishers.

Although KNP regulations prohibit some fisheries that are not compatible with biodiversity conservation, in practice a range of activities (see Table 3) are allowed to continue within the KNP. Drivers for fisheries demand include demand from export markets for live reef fish and demand by domestic markets for fish. Poor enforcement of policies and laws from 1999 and 2003 enabled this demand and resulted in expansion of muroami fishing (set nets on the seabed), the use of cyanide for collecting live reef fish and the uncontrolled harvest of clams. Since 2005, increased government and community co-operation and overfishing of stocks has led to a 10-fold reduction in these fisheries activities. Fish stocks on coral reefs have stabilised with some signs of improvement in no take zones from 2005 to 2009 (Ardiwijaya et al. 2008). Community involvement in reporting infringements has also risen since their involvement in park management. Recent developments by the Park Authority have involved villages in a community based surveillance program that aims to allow local fishers to report infringements which are supported by National Park laws and legal deterents, although this program is in its infancy. Economic development of coastal communities (eg. tourism, small-scale fishing and mariculture) is also supported by the district government and village leaders.

Impacts addressed	**Impacts not addressed**
■ Destructive fishing (blast and muroami fishing) (still happening but significantly reduced) ■ Poaching of clams in no take zones ■ Fishing in no-take zones (compliance at around 70-90%)	■ Some poaching in no take zones of reef fish ■ Use of cyanide for fishing of live fish for live reef fish trade (some efforts to influence fishers to change to more sustainable fishing practices) ■ Mariculture (grouper farming) – impacts have not been extensively documented ■ Crown-of-thorns starfish outbreaks

Table 3. Impacts addressed and not addressed in the enforcement of the KNP.

Effectiveness scale: 2 (some impacts partly addressed but some impacts not yet addressed)

6. INCENTIVES

Economic incentives

- Funding from private or NGO sources to promote the effectiveness of the MPA through the use of various incentives

The Wildlife Conservation Society (WCS) has allocated $700,000 over 5 years for assisting the KNPA develop and implement management and zoning plans. The KNPA has an annual budget of approximately $400,000 to manage the park. WCS has conducted an analysis of this in relation to conservation objectives and concluded that some activities such as enforcement and implementation of management with communities are not adequately funded.

- Promoting alternative livelihoods

From 2006 onwards district governments and NGO's have assisted communities with micro-credit facilities and management planning. In November 2008, fisher communities were provided assistance from the KNPA and NGO's to develop a mariculture business plan for the culture of the marine grouper (*Epinephelus polyphekadion)* where a portion of the profit returned to develop the business operation. The project aims to replace the ecologically destructive practice of cyanide fishing with a self-sustaining mariculture program. To date, six fisher households have participated in the program. Increased participation in this program to between 10 and 50 households in 2010 is planned.

A community group created by the local district government has been formed to manage local tourism activity and revenue from tourism has funded the building of schools, mosques and other facilities including water sanitation infrastructure.

- Enforcement of zoning regulations

Poor governance of the KNP over the past 6 years has generally failed to address legal obligations on protecting fishery resources from unsustainable and destructive practices. Improvements over the past 2 years have occurred with a reduction in dynamite and cyanide fishing, increased support for no take zones, fines for those caught harvesting protected species and reduction in the use of muro-ami nets. More is needed by government to work cross sectorally (eg. national parks, fisheries, tourism) to fulfil legal obligations related to the park.

The use of economic incentives appears to be the main mechanism through which the conflict between biodiversity conservation and local development needs is being addressed in the KNP. Fair distribution of benefits from small business, mariculture and tourism development is the key to further improve the effectiveness of economic incentives.

Participative incentives

- Collaborative Management

The urgency for government agencies and communities to work together to implement consistent policies and actions of marine resource use resulted in the KNP collaborative management forum. At the end of 2007, the

following needs of the forum were identified:

- District Regulations were required for tourism and fishery utilization to ensure management inputs from all stakeholders and consistency with park regulations;
- The establishment of a formal collaborative forum under the District of Jepara;
- Preparation of technical guidelines on the implementation of collaborative management;
- Establishment of regular meetings between the parties involved and the community;
- Capacity building for stakeholders, especially the district government and the community in terms of their role in the management of KNP; and
- Invitations from KNPA to the community and private parties to be involved in the management of KNP.

The KNPA facilitates the forum to identify threats to management and appropriate interventions. Village-based community networks within each of the three villages are represented on the collaborative management forum. Governments have initiated community ranger patrols, alternative fisheries and the promotion of tourism.

- Strategic planning for communities

The process of "Rencana Strategis" or "Renstra" (strategic planning) was initiated in Parang Village in 2007 and produced a community management plan to guide economic development and conservation. In 2009, the district regional body responsible for planning and development (BAPPEDA), the Jepara Fisheries Service and the KNPA adopted the Parang Village Management Plan as a coordinating mechanism for community village management within the KNP. Strategic planning processes for Karimunjawa and Kemujan villages have started and all plans will be pivotal to achieving KNP biodiversity objectives.
The plans aim to ensure that adequate representation of all user groups within villages. These participative incentives offer some potential to address locally-based threats in the KNP, but cannot mitigate against the impacts of drivers emanating from national and international forces and are hence constrained in their effectiveness.

Participative incentives are less important than economic incentives but are perceived as more important nonetheless than legal, interpretative and knowledge incentives to fostering genuine community participation with management agencies.

Interpretative Incentives

- Public communication, education and awareness raising on the importance/vulnerability of marine ecosystems and the benefits of the MPA

The KNPA, NGO's and community groups have organised various education and outreach programmes (eg. Independence Day events), on the importance of protecting coral reefs and other marine resources. Environmental education programs including Seagrass Watch and Coral Reef Monitoring have been conducted at village schools raising awareness of the marine environment and issues affecting its health.

1000 posters of the new zoning regulations were disseminated by local park rangers and NGO's to local communities in 2006 to raise awareness among communities of the park regulations and boundaries. The posters were disseminated, who also discussed the regulations in face-to-face meetings with stakeholders. Evaluation of community perceptions of new park regulations has led to a plan to increased signage at strategic areas to improve knowledge and awareness of the park regulations.

Marine buoys have been positioned at the boundaries of new zones to inform fishers of the position of zones and patrols conducted by marine national park staff inform fishers of the new regulations.
A video has been produced with information on the ecosystem services provided by healthy coral reefs, seagrass and mangroves and distributed in local communities.

Interpretative incentives play an important role in influencing public attitudes towards the KNP over a longer time frame, but they are less important as other incentives (legal, economic and participative) in addressing immediate environmental and social concerns.

Knowledge incentives

- Monitoring of marine resources

Standardized resource monitoring protocols are being used by the KNPA and different research groups working within the park.

Local community groups have been involved in regular fish catch and compliance monitoring to raise awareness of the importance of fishing regulations and provide information on compliance with the zonation plan.

Monitoring and evaluation occurs annually on coral reef, seagrass and fishery resources. Community workshops disseminate information on management evaluations using data from ecological, fisheries and socioeconomic surveys.

There has extensive use of knowledge incentives in the KNP with well designed research and monitoring programs in place and these and considered to play a greater role than legal, interpretative and knowledge incentives in engaging communities in on the ground management and support for MPA objectives in the KNP.

Legal Incentives

- Enforcement of laws

Legal frameworks for conservation and enforcement responsibilities exist, but insufficient national-local state capacity, political will, surveillance technologies and resources are available to enforce restrictions and coordinate enforcement operations among National Park and Fisheries government agencies. Consistent application of cross-jurisdictional laws to reduce exploitative activities (eg. live reef fish trade) are required. Improvements are occurring with the apprehension and prosecution of clam poachers and the training of community patrols, but fishing inside no take zones and use of destructive fishing gears continues.

Awareness and understanding of the regulations of Karimunjawa National Park among communities have risen from 2003 to 2009 (Yulianto et al. 2009), but the need to foster stewardship and involvement of communities in management remains. Through village-level regulations (*perdes*) that focus on fishing rights and economic development for individual villages, a legal framework for local management actions is being enacted through agreements between villages, the district leader (*Bupati*) and district (*Kabupaten*) government agencies (eg.

Fisheries, Tourism, Development and Planning) empowered under Fisheries Law 31/2004. Four such perdes have been legislated on Karimunjawa and these legal incentives are currently being directed towards adaptive conservation management at the local level through the process of “Rencana Strategis” or “Renstra” (strategic planning). Community management plans are being developed to guide economic development and conservation measures, building upon existing village institutions and focusing on activities which reflect the needs of local communities.

- Fisheries conservation

An initiative to ensure that fisheries in Karimunjawa will be in compliance with the KNPA regulations and community management goals was started in September 2008. All government agencies and stakeholders met with Jepara Fisheries Service (JFS) to offer input into the Fisheries Management Plan Initiative. JFS, in conjunction with the district fisheries government agency have drafted a set of fisheries spatial planning regulations that are consistent with KNPA regulations.

- Adaptive management

The zoning plan for the KNP is being evaluated annually by a well designed ecological, fisheries and socioeconomic monitoring program. Combined with information on fisheries use and catches the aim is to adaptively modify park zones and regulations after 5 years if required. The approach takes account of the social-economic and political contexts in the KNP.

Legal incentives are important to achievement of biodiversity objectives of the KNP with solid legal framework and laws in existence. Their effectiveness is dependent on state capacity and political will. Although less important than economic, participative and knowledge incentives, community support and development of local government laws (perdes) are crititcal for community engagement in KNP management and effective conservation management.

The Wakatobi National Park
Governance Analysis

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1 CONTEXT

Name: The Wakatobi National Park (WNP)
Size: 13,900 km^2
Coastline length: n/a. However, the total land area within the WNP is approximately 463.7 km^2. This represents around 3% of the total park area.
Distance from shore: n/a

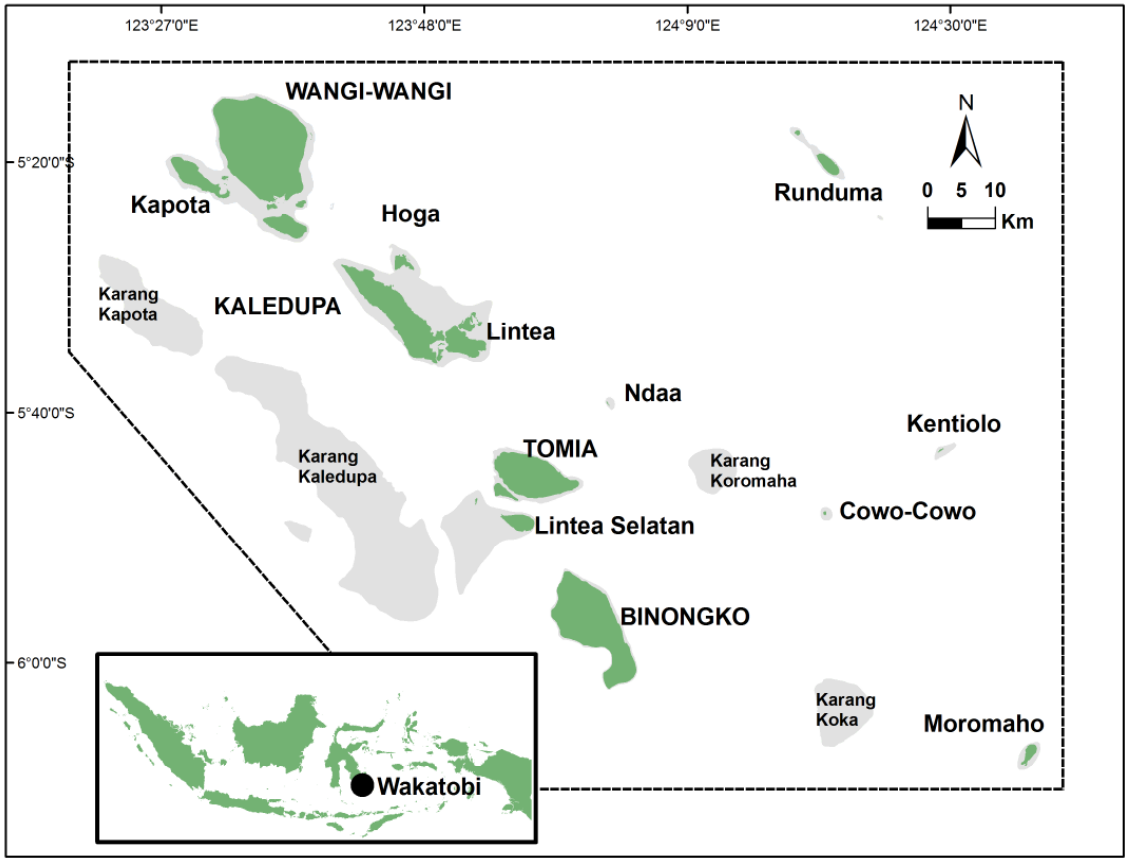

Figure 1 Location map for the WNP

	National	Provincial (South-east Sulawesi)
Population per km^2 (2005) [1]	116	51
Annual population growth rate (2000-05) [1]	1.3%	2.02%
GDP per capita $US (2004) [2]	1,042 [2]	505 [2]
GDP composition (2004) [2]	Agriculture: 15.8% Industry: 42.4% Services: 30.9%	Agriculture: 41.1% Industry: 19.3% Services: 39.6%
Labour force by occupation (2008) [3]	Agriculture 42.1% Services 39.3% Industry 18.6%	n/a
Unemployment rate (2008) [3]	8.4%	n/a
Government type	Republic	

Sources: [1] Statistics Indonesia (2006); [2] Hill *et al*. (2008): corrected to 2008 prices and exchange rate of $US1 = IDR10,000; [3] CIA World Factbook (2009)

The Wakatobi National Park is located in the province of south-east Sulawesi in eastern Indonesia and its boundaries are congruent with the Wakatobi Regency (*kabupaten*) tier of government. The province of south-east Sulawesi is ranked towards the bottom of most national socio-economic indicators and is classified as a 'very poor' province which has been slow to make the transition from an agrarian economy (Hill *et al*., 2008). Two ethnic groups are present in the WNP, which has a current population of around 100,000. The vast majority (92%) are of local Butonese origin, alongside the Bajau who number approximately 7,000 in six settlements within the park. From a governance point of view, the Bajau are significant stakeholders in resource management as they are heavily reliant upon the marine environment for food, fuel and building materials, and generally live in houses constructed upon stilts in the intertidal zone.

2 OBJECTIVES

The revised 25 year management plan produced in 2008 defines a vision for the park which involves the establishment of a sustainable environment with benefits to local resident communities and for regional development. The inclusion of the latter clause is interesting as it signifies the imperative to integrate park management with broader economic development strategies. Key habitats and species comprising coral reefs, seagrass meadows, fish spawning aggregation sites, mangroves, cetaceans, water bird nesting areas, turtle nesting sites and economically valuable marine species are identified as priorities in the management plan. Reference is made to obligations associated with the Convention on Biological Diversity, as well as a large number of domestic Acts and other legislation. However, no information is provided relating to the decline in any of these resources or targets for management, other than maintaining existing levels of hard coral cover which are estimated to be around 35-40%.

The zoning plan and associated regulations are illustrated in Figure 2 and Table 1. These are used to derive management objectives in the current plan which comprise effective zone management, monitoring of reefs, seagrass meadows, mangroves and fish spawning aggregation sites and to engage in public awareness raising exercises with local communities. The latter are to be implemented through village meetings, leaflet distribution, establishing markers around core zones and providing information displays. Effective zone management can be assumed to relate to enforcement through patrolling, the funding for which is recognized in the plan as a management concern.

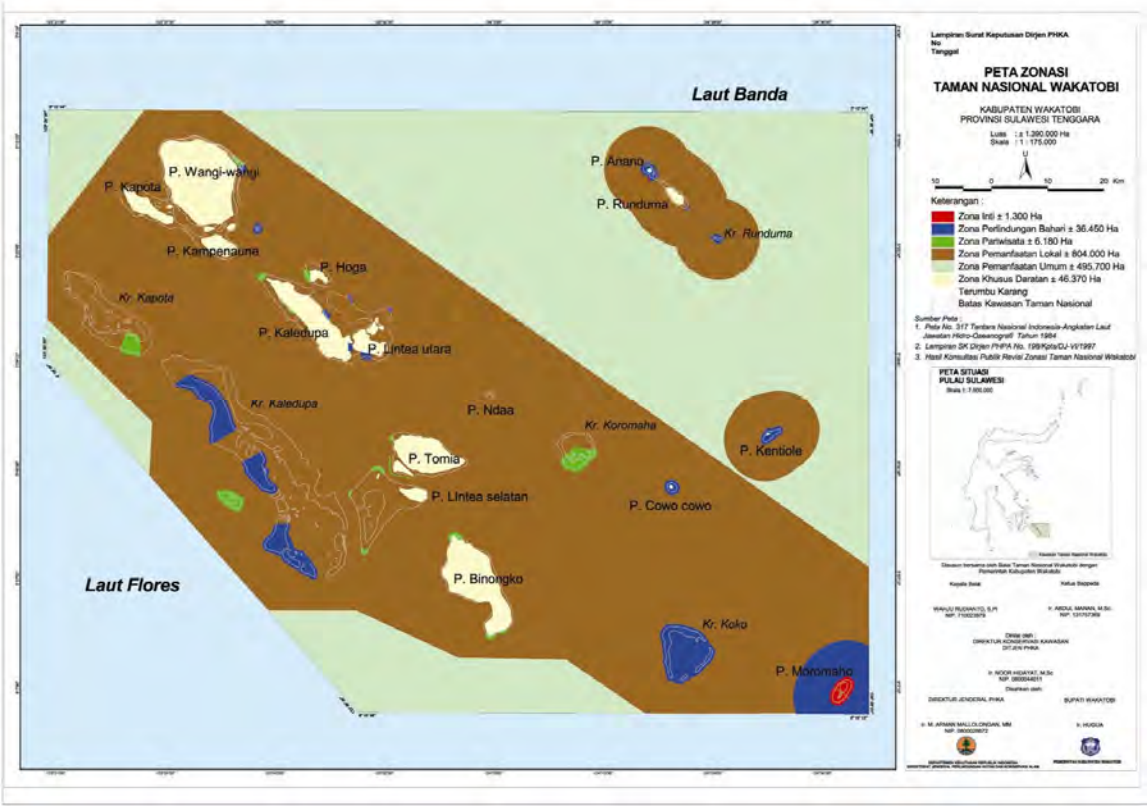

Figure 2 Zoning plan for the Wakatobi National Park. Source: The Nature Conservancy (2007). Reproduced courtesy of The Nature Conservancy and the Directorate General of Forest Protection and Nature Conservation.

	Core zone	*Marine zone*	*Tourism zone*	*Traditional use zone*	*General use zone*	*Special land zone*
Area covered (ha)	1,300	36,450	6,180	804,000	495,700	46,370
Fishing (all techniques)	x	x	x	✓	✓	n/a
Research	p	p	p	p	p	n/s
Boat transit only	[✓]	✓	✓	✓	✓	n/a
Boat transit and anchoring	[✓]	✓	✓	✓	✓	n/a
Tourism	x	p	p	p	p	n/s
Restoration and rehabilitation	x	x	✓	✓	✓	n/s
Education	p	p	✓	✓	✓	n/s
Traditional and ritual use	p	p	✓	✓	✓	n/s

Table 1 Regulations governing activities in the WNP. Adapted from The Nature Conservancy (2007).
Key: ✓: permitted; [✓]: permitted only in emergency; x: forbidden; p: prior permit required; n/s: not specified; n/a: not applicable

3 DRIVERS/CONFLICTS

3.1 Illegal resource usage

Figure 3 details the type of illegal resource usage and number of offenders detected by the WNP authorities during the period 2003-2008. The annual total number of cases displays little consistent trend, with bomb fishing being the most common category of offence.

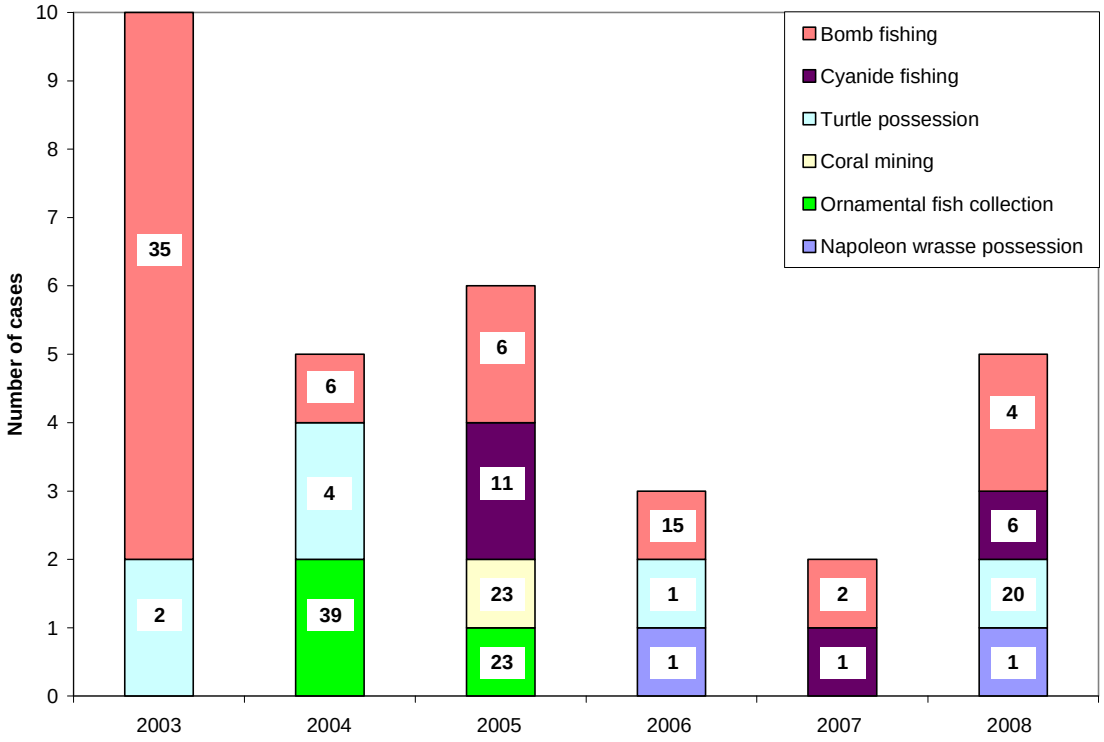

Figure 3 Record of offences detected in the WNP 2003-2008. Inset numbers denote total number of individuals involved in each category of offence.

The economic drivers for bomb fishing are localised in that it represents a means of more efficient fish catches, particularly where other techniques yield lower returns as stocks are over-exploited. Within the Bajau, there also exist cultural drivers which may be reflected in the continued use of bomb fishing. Catch sharing remains a tradition within Bajau society, representing insurance against unpredictable catches and constructing informal networks of trust and reciprocal responsibility amongst those involved. Those who share their catch are recognised within the community and can use this to their advantage in other social situations. This is relevant to bomb fishing as those practicing this technique share their catch through allowing other fishermen to collect fish once they have taken the amount they require. Consequently, these individuals may actually be held in high esteem and the practice may be seen by others as a means to gain prestige within the community.

Cyanide fishing is connected to the live reef fish and ornamental fish trade, the demand for which is centred in Hong Kong, China, Taiwan, Singapore and Japan. Population growth and economic development are clearly significant in driving demand, which currently involves a supply network extending across the Indo-Pacific (Muldoon and Johnston, 2006). The recent extension of air transport infrastructure to the Wakatobi clearly offers a means whereby live reef fish could be transported quickly out of the region.

The trade in protected or endangered species, notably turtles, constitutes an ongoing problem in the WNP. Green turtles (*Chelonia mydas*) and hawksbill turtles (*Eretmochelys imbricata*) tend to be caught opportunistically, mainly by Bajau net fishers. Whilst the export of these is banned, the presence of live turtles awaiting export is commonly observed in Bajau villages and generally elicits little response from park authorities, whose reluctance to intervene is indicative of the poor relations between enforcement officers and Bajau communities. Other species of concern include the high value napoleon wrasse (*Cheilinus undulatus*)

which, whilst protected under national law, may be exported to markets including Hong Kong and Taiwan through quotas allocated to specific companies.
Coral mining has been highlighted elsewhere as an issue of concern (Caras and Pasternak, 2009). However, this is considered to be insignificant, given the availability and access to cheaper land rock from the islands in the park, the lack of detected offences involving coral mining (Figure 3) and the absence of references to coral mining in the current management plan (Clifton et al., 2010).

3.2 Artisanal fishing

Declining fish catches are seen as symptomatic of the degradation of marine environmental quality in the Wakatobi, with evidence including a rapid expansion of fish traps and a decline in specific fisheries including octopus and sea cucumber being cited. The primary cause is commonly ascribed to population growth, which is above the national average in the Wakatobi. However, temporary migration is commonplace in the Wakatobi and hence a simple correlation between total population growth rates and perceived declines in fish stocks should not be assumed. Furthermore, many fishermen, particularly amongst the Bajau, do not perceive a decline in catches, reflecting a combination of spiritual beliefs and personal luck as being significant determinants of an individual's daily catch.
Changes in fishing technology may constitute a more significant factor. These include the introduction of cheap and durable nylon nets which have enabled fishermen to operate individually rather than within groups organised by a limited number of net owners, which has served to increase total fishing effort. Whilst more recent data are not available, only 2% of the boats registered to local residents in 2000 were engine-powered, which had increased to 18% by 2003 (TNC/WWF, 2003). This would increase the range of fishing grounds available to individuals and reduce the limitations imposed by seasonal climatic variations. The fishing effort associated with mechanised vessels may be further stimulated as a coping strategy in response to external pressures such as recent increases in domestic petrol prices.

3.3 Tourism

The drivers for tourism include external factors such as increased disposable income in developed countries, competition amongst airlines and the growth of the budget airline sector, favourable exchange rates and investments in infrastructure in host countries. The absence of regular or fast transport from the airport in the provincial capital of Kendari has been the most significant constraint upon tourism development in the WNP. However the recent opening up of a privately built airstrip to commercial use on the island of Tomia and the construction of a public airstrip on Wangi-Wangi in 2009 have dramatically altered this situation, with visitors to the park increasing from 5,000 in 2009 to 20,000 in 2010 (Antara News, 2010).The adverse environmental impacts of tourism development will be accentuated by the virtual absence of any supporting infrastructure, particularly with regards to waste disposal. Tourism policy will, therefore, constitute a major issue with regards to achieving the biodiversity and conservation objectives of the park.

4. GOVERNANCE FRAMEWORK/APPROACH

Coastal management in Indonesia is characterised by an absence of both horizontal and vertical integration, resulting in many instances of contradictory policies and confusion over responsibilities (Patlis, 2005; Dirhamsyah, 2006). The Ministry of Forestry retains authority for managing the national protected area estate through its implementing agency, the Directorate General of Forest Protection and Nature Conservation (*Direktorat Jenderal Perlindungan Hutan dan Konservasi Alam* or PHKA). In contrast to many other areas of government, the Ministry of Forestry remains a highly centralised organisation, with branches of the PHKA being responsible for implementing policies decided at Ministerial level in Jakarta. This limits the ability to which management plans and policies can be adapted to local circumstances, as illustrated in the account of the Wakatobi zoning plan discussed below.
The first zoning plan for the WNP was produced in 1997 by the Jakarta offices of the PHKA without public consultation within a year of the park being designated. Inevitably, this resulted in limited public awareness of the park's existence or its zoning, whilst measures in the management plan recommending alternative income-generating activities such as milkfish farming, shrimp farming or ecotourism were far removed from local reality.

The virtual absence of management by mandated government authorities led to two related consequences for the political and administrative context of the Wakatobi. The first of these, from 1996 to 2003, involved the assumption of conservation-related activities by ecotourism operators within the park. This phase can be described as being governed by **improvised partnerships** between the park authority and private tour operators, primarily focused upon establishing no-take areas in proximity to the tour operators' sites. Whilst successful in terms of restricting illegal resource usage, these did not contribute towards wider biodiversity as their siting reflected the location of dive sites rather than sites of ecological significance to the park. From an administrative perspective, the effective declaration of no-take zones by a private ecotourism operator clearly further undermines the PHKA's ability as the mandated authority to design and implement conservation policies for the park as a whole.

Subsequent to 2003, the involvement of international NGOs in the WNP, particularly TNC/WWF, has resulted a new management plan (Figure 2 and Table 1) reflecting ecological criteria which was the focus of public information campaigns from 2007 onwards. Governance may now be described as a **strategic partnership** involving alliances between TNC/WWF, the PHKA, the newly created *kabupaten* Wakatobi and the tour operators. The main emphasis in this stage of the park's management has reflected TNC/WWF's priority of eradicating destructive fishing and illegal marine resource usage, primarily through heightened enforcement. Whilst contributing directly towards biodiversity conservation, these activities do not involve positive incentives to discourage participation, the primary incentive being a negative one associated with the risk of detection and punishment.

5 EFFECTIVENESS

The initial designation of the Wakatobi Marine National Park in 1996 had very little impact on addressing impacts from local activities. In this early period, from 1996 to approximately 2003, the park would be best situated at stage 1 of the scale. This reflects a lack of funding, resources, local awareness and expertise. Since 2003, the roles assumed by external NGOs and tourism operators have addressed the impacts of fishing, principally destructive fishing, and the utilisation of protected species. It is very difficult to quantify the 'success' of these activities given the lack of long term monitoring data. However, any impacts are localised spatially and inconsistent temporally, given the reliance on patrols as a means of implementation. The WNP is therefore currently assessed to be at stage 2 of the effectiveness scale.

Presently, the WNP may be best described as 'stable'. Whilst recent investments by international NGOs have considerably improved the expertise, data and resources available to the WNP authorities, this cannot reasonably be described as representing a positive trend in MPA effectiveness. The commitment by these NGOs is uncertain, with a recent decline in overseas funding resulting in a diminished contribution towards local management activities. Secondly, it is not possible to pinpoint a specific 'improvement' such as a decline in offences or a positive trend in biodiversity indicators which may be associated with such activities. Finally, the key drivers behind the main perceived threat of overfishing may not be significantly influenced by activities such as heightened enforcement in the longer term.

6 INCENTIVES

6.1Economic incentives

- *Promoting economically and ecologically sustainable resource exploitation*

Efforts to promote sustainable resource exploitation in the WNP have suffered from a lack of awareness or recognition of the cultural context within which such activities take place. This has adversely affected their success and, equally importantly, will colour local communities' views on future activities. The installation of fish-aggregating devices termed *rompongs* with AusAID funding in 1999 for use by the Bajau community of Sampela in Kaledupa illustrates this situation. Despite resulting in improved catches initially, disputes arose relating to the ownership of the *rompongs* and rights of access. This resulted in the decision by a minority of wealthier fishermen to allow commercial purse seining, resulting in an immediate decline in catches and the abandonment of the *rompongs*. Participation in the project was also limited by individual preferences to continue traditional, albeit less productive, methods of fishing in shallow waters rather than targeting pelagic stocks associated with the *rompongs*.

- *Providing economic compensation for restricted users for profits foregone*
- *Improvements in local infrastructure and living standards*

The 'reef leasing' scheme introduced by the Tomia-based operator in 1999 represents another example of economic incentives which have deleterious socio-economic consequences. Compensation equivalent to US$500 per month is paid to each village under this scheme in return for a cessation of all fishing activity, the money being spent on public building repair and transport infrastructure. Whilst these agreements are made between the tour operator and local government institutions, the group most affected by the ban on fishing activity are subsistence line fishers. This group is characterised by low levels of literacy and education, and are therefore directly or indirectly excluded from village bureaucracy and public meetings. The process of identifying fishing grounds itself was at odds with pre-existing practices, given the lack of either formal or informal inter-village agreements relating to fishing activity in the region. A final point relates to the implications of setting aside such large areas of reef as no-take areas equivalent to 'core zones'. This effectively subsumes the authority of the WNP and presents obstacles to improving governance of the park as a whole.

Economic incentives constitute the most important group of incentives in terms of promoting the effectiveness of the MPA, given the success in addressing perceived problems of overfishing and illegal resource usage. However, they can contribute towards social and economic disruption within local communities as they are designed with short term business objectives in mind or without consideration of the cultural context in which they take place. Given the reliance on NGO sources for funding and implementation, there is a real risk of institutional capture which could undermine the effectiveness of the MPA, particularly with regard to generating support for its existence within local communities.

5.2 Interpretative incentives

The view of marine resources as aesthetically appealing and ecologically valuable is one rooted in Western notions of tropical marine environments. Local communities, however, view the marine environment as a source of basic requirements including food as well as fuel and building materials, presenting obvious challenges from a conservation viewpoint. Scientific explanations of the benefits of MPAs such as spillover are difficult to transpose into the local cultural context, whilst the implied acceptance of delayed benefits also conflicts with the emphasis on meeting daily subsistence needs common within local fishing communities. Even where such benefits can be 'proven' with scientific monitoring of no-take areas, the conceptual link between reduced fishing effort and changes in fish stock characteristics is not shared by many local fishers.

These contrasting fundamental perceptions of the marine environment and the impacts of fishing activity render interpretative incentives of little utility in the WNP, as they are based upon environmental values and deductive scientific reasoning rooted in Western society, both of which have limited resonance with the local cultural context.

5.3 Knowledge incentives

- *Integration of local/traditional/indigenous knowledge in MPA decision-making*
- *Maximising scientific knowledge to guide/inform MPA decision-making*
- *Promoting mutual respect and collective learning between different knowledge owners*

All of these incentives are potentially important in the WNP, which has a relatively rich history of scientific research but is characterized by a continuing gulf of understanding and empathy between researchers and local residents. Success in implementing these incentives, however, is difficult as local residents' utilitarian views of the marine environment conflict with marine scientists' personal and professional interests.

The experience to date suggests that such incentives would be best achieved through an active encouragement of holistic marine research involving social scientists alongside natural scientists, with advice from the former being used to adapt recommendations based upon the latter's research in order to derive activities which effectively integrate local knowledge into management.

5.4 Legal incentives

- *International-regional-national-local regulatory obligations that require effective MPA conservation, including the potential for top-down interventions*
- *Provision of financial and institutional resources from the state for MPA governance, particularly law enforcement*
- *Scope for flexibility - adaptive management and local discretionary action, provided that this does not undermine the fulfillment of conservation objectives*

The key drivers for drivers of activities with actual or potential negative impacts on resource conservation in the WNP include population growth, technological advances increasing fishing efficiency, the overseas demand for illegally traded species and the prospects for increased visitor numbers. Management of these is hindered by a sectoral approach to conservation, uncertainties regarding jurisdiction in an era of decentralisation and vested political interests promoting economic development within the WNP.

Almost all of these reflect processes operating at the national and international level and it is difficult to see how policies could be devised to address the majority of these issues in a manner which would specifically benefit marine conservation. Effective enforcement of CITES and other conventions relating to the trade in endangered species and control of the live reef fish trade are possible, but remain distant. Similarly, the provision of sufficient state funds to enable effective MPA governance in Indonesia remains a remote prospect.

Given the overlapping and contradictory legislation affecting marine conservation in Indonesia, the absence of a clear and consistent legal framework across all relevant sectors is a clear hindrance to effective park management. Under the current process of devolution (*reformasi*) within Indonesia, legal incentives offer considerable potential for improving MPA management. A legal framework for local discretionary action exists through the implementation of village level byelaws (*perdes*) which can be enacted under agreement between village and district levels of government, whilst the latter is also empowered under Law 31/2004 to undertake marine conservation and management activities within 4 nautical miles of the shoreline. Legal incentives could be directed towards adaptive management and local discretionary action, building upon existing village institutions and focusing on activities which reflect the needs of local communities. However, the willingness of local government in the Wakatobi to embark upon processes to establish such village-level regulations is uncertain at present, with the result that legal incentives represent a potentially significant yet hitherto unrealised means to improve MPA effectiveness.

5.5 Participative incentives

- *Participative governance structures and processes such as stakeholder committees, stakeholder consultations, participative GIS planning*
- *Bringing in 'neutral' facilitators to facilitate participative processes*

There is a history of attempts to ensure participatory planning in the WNP, most of which have been instigated by NGOs and private tourism operators. However, these are vulnerable to elite dominance or discourse capture by particular groups within the fishing community. The Kaledupa-based Darwin Initiative project plans to establish new village-based institutions (termed Village Fishers Forums) involving all fishermen and a representative of the BPD. Whilst theoretically attractive, this does not ensure that adequate representation of all user groups can be achieved. Furthermore, the concept of 'neutral facilitators' is difficult to conceive in the WNP context. The examples of consultation processes outlined above have all been instigated and developed by organisations and institutions with key objectives in mind, whilst the availability of 'neutral' facilitators is clearly limited given the remote location of the WNP.

Appropriately designed participative incentives that reflect informal institutions, often at the extended family or user group level, offer some potential to address locally-based threats in the WNP. However, these cannot mitigate against the impacts of drivers emanating from national and international forces and are hence constrained in their effectiveness.

6. Cross cutting issues

7.1 Leadership

Strong, democratically elected leadership at the community or user group level is necessary for economic incentives, which represent the most significant chance of improving effectiveness, to be successful. Such leaders would reduce the likelihood of economic benefits being captured by elites often operating through other village-level institutions. These individuals are also in a position to counteract the influence of NGOs and higher levels of government which may pursue policies to the detriment of the weaker and poorer sections of fishing communities. The democratic accountability of these individuals should go some way towards ensuring that these goals are met.

6.2 Role of NGOs

NGOs, including tourism operators, have been instrumental in funding, delivering and monitoring key activities within the WNP, although these have focused exclusively on economic incentives to improve effectiveness. International NGOs have worked in partnership with park authorities and local government to develop the WNP as a site of international significance within the Coral Triangle Initiative, thereby indirectly promoting some interpretative and knowledge incentives. Locally-based NGOs can act as 'brokers' liaising between the local community and the larger NGOs, thereby facilitating community awareness and, possibly, acceptance of policies promoted by the latter (Steenburgen, 2006). However, the financial resources of larger NGOs and foreign-owned tour operators imbues them with the power to influence or ignore park authorities and local government, giving rise to some *ad hoc* conservation measures designed for tourism rather than marine resource management.

6.3 Equity

The Bajau community experience social and economic marginalisation reflecting their perception as an 'outsider' group throughout Indonesia and elsewhere in south-east Asia. This has been exacerbated in the Wakatobi through measures designed to improve MPA effectiveness, particularly with regard to economic incentives. This reflects fundamentally different perceptions of marine resources which, for the Bajau, exist for exploitation and usage rather than conservation. This in turn reflects a combination of a high level of dependence upon these resources, a predominantly subsistence lifestyle and cultural and spiritual views regarding fish stock abundance (Majors, 2008). Coupled with the Bajau preference to maintain their identity through abstaining from participation in official government initiatives, economic incentives based upon activities such as establishing reserves or promoting sustainable resource exploitation receive little support from the Bajau community. Providing alternative income-generating activities is also not considered relevant, given the intimate and longstanding association between Bajau culture and fishing practices. This serves to both reinforce cultural stereotypes along with existing patterns of inequity. As long as these programmes are based upon a predominantly protectionist notion of 'conservation' rooted in Western scientific thought, inequity will persist and participation of the Bajau in any initiatives will remain minimal, which will inevitably undermine the effectiveness of such initiatives.

6.4 Stewardship

Repeated surveys of public opinion in the WNP have demonstrated uncertainty with the concept of marine protected areas and associated regulations (Widodo *et al*., 2009), implying that there is a need to foster stewardship based upon local ownership rather than the possibly more abstract concept of MPA designation. The creation of a new Wakatobi regency (*kabupaten*) government area whose boundaries are congruent with the WNP offers additional means to build a sense of community identity with the park. These could be developed through the use of village-level regulations (*perdes*) with the focus on fishing rights for individual villages being a suitable focus for initial action to promote a sense of ownership.

Tubbataha Reefs Natural Park
Governance Analysis

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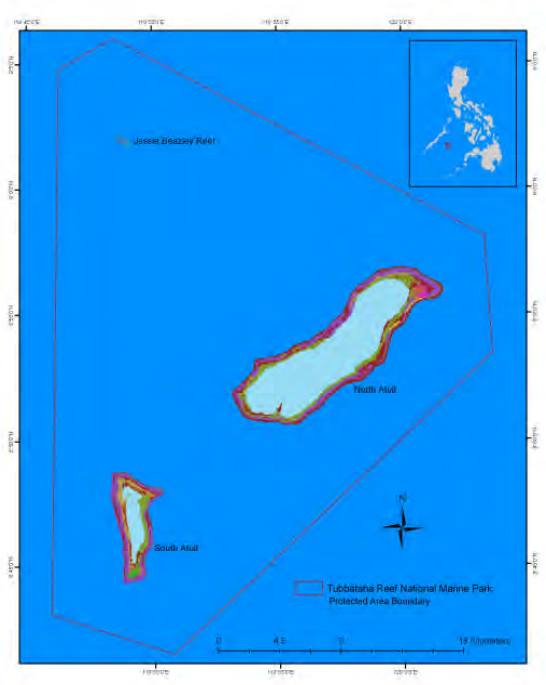
1. CONTEXT

Name of MPA: Tubbataha Reefs Natural Park
Size of MPA: 968.28 km^2

	Philippines	**Palawan (the province where Tubbataha belongs)**
Population per km^2:	328.6	52.4
Population growth rate:	1.975 (CIA,2008)	3.6
Per capita GDP:	US$3,300	No data
GDP growth rate:	4.6% (2008)	No data
GDP composition by sector:	(CIA, 2009) agriculture: 14.7% industry: 31.6% services: 53.7%	No data
Labour force by occupation:	(CIA, 2009) agriculture: 35% industry: 15% services: 50%	No data
Unemployment rate:	7.4% (NSO,2008)	17.9 (NSO,2003)
Government type:	Republic	

The Tubbataha Reefs Natural Park is nestled in the middle of the Sulu Sea, within Philippine territory and is approximately 150 km offshore from Puerto Princesa, the capital city of Palawan in the southwest corner of the country. It is under the political jurisdiction of the Municipality of Cagayancillo, 130 km to the north of the atoll. "Tubbataha" is derived from the Samal language of the seafaring people of the Sulu Sea, which means "a long reef exposed at low tide". Two coral atolls, the North and the South, and a submerged reef, the Jessie Beazley Reef, comprise the Tubbataha Reefs Natural Park (TRNP). The islet in the north atoll is called Bird Islet and hosts most of the seabird residents in the park while the South Islet has a lighthouse.

These two islets are breeding and rookery grounds for migratory and resident seabird species, some of which are classified as priorities for conservation. North Islet is the breeding ground of an endemic subspecies of black noddy, *Anous minutus worcestri*, and an important rookery of the critically endangered Christmas Island frigate (TRNP Management Plan 2007). The reef systems are composed of continuous reef platforms 200-500



m wide, completely enclosing sandy and coral substrate lagoons with a maximum depth of 40 m. On the inner side of the platform are shallow reef flats and seagrass beds. The TRNP harbors a diversity of marine life equal to or greater than any such reef of its size in the world. It is home to at least 379 species of corals or almost 90% of all coral species in the Philippines, 510 species of fish, 11 species of shark, 7 species of seagrass, 79 species of algae, at least 2 species of marine turtles and 12 species of marine mammals. Rays are common in the reefs. Large pelagic fish, such as tuna, mackerel, jacks and barracudas, are observed in schools near the reef crests.

Map Showing Tubbataha Reefs Natural Park Boundaries

2. OBJECTIVES

Tubbataha falls under IUCN Category II:National Park, defined as protected areas which are large natural or near natural areas set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area, which also provide a foundation for environmentally and culturally compatible spiritual, scientific, educational, recreational and visitor opportunities. At a regional scale, Tubbataha is a priority conservation area under the Sulu Sulawesi Marine Ecoregion and the Coral Triangle Initiative.

Four overarching policies apply for the long-term management of Tubbataha:

1. The economic, biological, socio-cultural, educational and scientific values of the TRNP shall be conserved and protected into perpetuity for the enjoyment of present and future generations.
2. Activities that compromise this goal shall not be allowed.
3. In consonance with the above, any exploration, exploitation or utilization of non-renewable resources within the TRNP shall not be permitted.
4. Active collaboration and participation by all stakeholders shall be fostered to engender a sense of ownership and promote compliance to regulations.

The following specific objectives reflect the desired results of management programs for the TRNP:

1. Biological diversity and ecological processes are protected from unnatural threats and direct human impact;
2. Legal and management structures are effectively maintained;
3. Stakeholder participation and representation are ensured;
4. Public understanding of the benefits of conserving the TRNP is improved; and
5. Revenues from ecosystems targeted for conservation are enhanced.

3. DRIVERS/CONFLICTS

Pressures threatening the Park and its management evolve. Achieving success in addressing a particular issue is not a reason to sit back and relax. The management effectiveness evaluation undertaken very recently (29-30 September 2009) by the Monitoring and Evaluation Team of Tubbataha identified the issues addressed but are still continuing and the current threats and constraints, as follows:

Biophysical Threats	Socio-economic Issues	Institutional Constraints
1. solid waste/pollution from several sources outside of Park boundaries 2. COT infestation 3. beach erosion 4. climate change	1. limited information, education and communication (IEC) 2. limited skills in resource valuation as a function of developing market incentives	1. low compliance 2. slow and precarious judicial process 3. limited policies 4. limited academe involvement 5. resource use conflict 6. funds sustainability

4. GOVERNANCE FRAMEWORK/APPROACH

TRNP is part of the National Integrated Protected Areas System of the Philippine Government through the Department of Environment and Natural Resources (DENR). It was initially protected by Presidential Proclamation 306 in 1988 and later on by Presidential Proclamation 1126 in 2006. It is also a protected area under the Strategic Environmental Plan for Palawan which is an enabling law for both developmental and environmental activities in the province. In 1993, the park was declared a World Heritage Site by the United Nations Educational, Scientific and Cultural Organization (UNESCO). And in 1999 Tubbataha was included in the Ramsar List of Wetlands of International Importance.

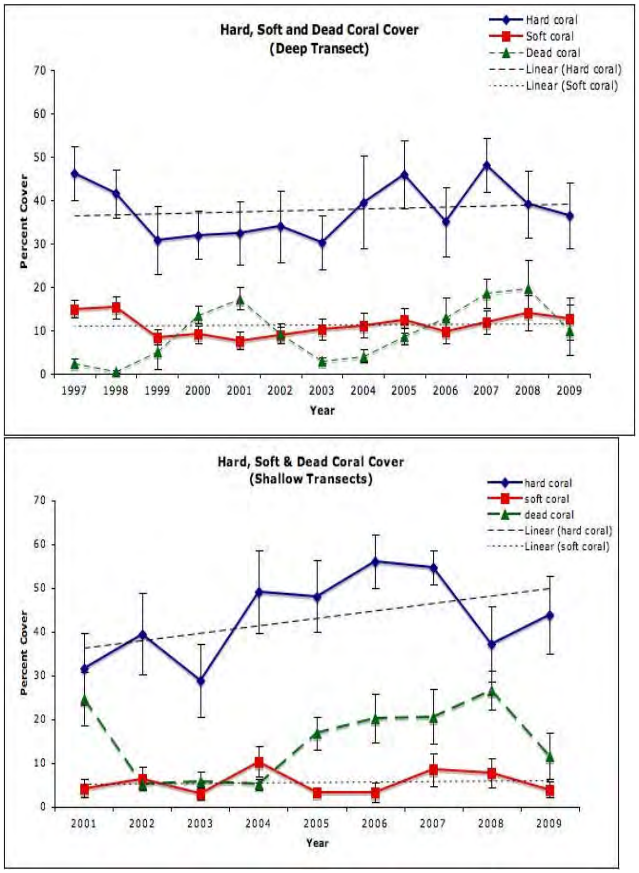
The management of the park went through transitions- from the DENR (1990) to the Tubbataha Foundation, a group composed of concerned divers and sport fishers. In 1995, the multi-sectoral Task Force Tubbataha was formed, and then Pres. Fidel V. Ramos ordered the Armed Forces of the Philippines to maintain a year-round presence in the site. Based on the Tubbataha Management Plan formulated through a series of consultations and iterations (1992-1998), the Tubbataha Protected Area Management Board (TPAMB) was created in 1999. The TPAMB is a multi-sectoral body that formulates policies for Tubbataha. It is made up of 19 representatives from the provincial and municipal governments, national enforcement agencies, Cagayancillo people's organization, NGOs, local universities and dive-tourism sector. The TPAMB meets quarterly, and there is also an Executive Committee (ExeCom) which meets monthly to keep management current. The ExeCom members are representatives from WWF-Philippines, Palawan Council for Sustainable Development (PCSD), Philippine Navy, Philippine Coast Guard, Saguda Palawan and DENR. Day-to-day park management is carried out by the Tubbataha Management Office (TMO), the executive arm of the TPAMB solely dedicated to implementing the management plan and maintaining presence in the park.

The Tubbataha Management Plan approved in 1998 was revised in 2002 to incorporate systems developed in regulating park activities, entry permits, collection of conservation fees and ecosystem research. In 2004, another revision incorporated the park management effectiveness monitoring and evaluation program. Other programs were streamlined, based on experiences in the implementation of the UNDP-GEF funded Tubbataha Conservation Project. The last revision institutionalized the monitoring and evaluation system in managing Tubbataha, and provided a more structured feedback mechanism. The component on policy and advocacy was also incorporated into the conservation management program (Dygico 2006).

5. EFFECTIVENESS

Biophysical. Seven transect sites for benthic and fish community surveys have been established at depths of 10m and 5m within the park which has approximately 100 square kilometer of coral reef. Monitoring for the

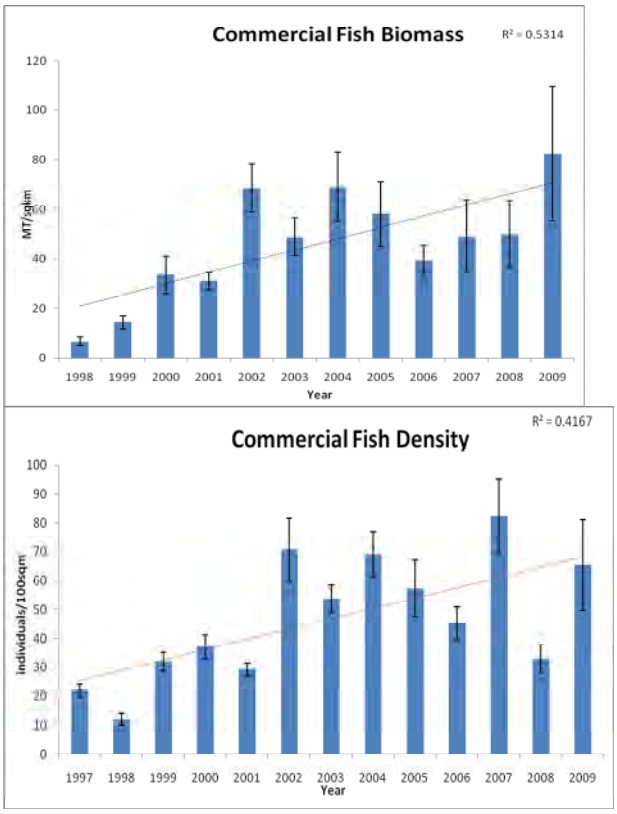
last 13 years in Tubbataha has shown that the live coral cover is stable after the bleaching of 1998, when coral cover declined about 22% (Arquiza and White 2000).



Mean percentage cover of hard (blue), soft (red) and dead (green) corals at 10m and 5m depths from 1997 to 2009. Error bars represent the standard error of the mean.

Fish biomass in the TRNP continues to be the highest recorded in the Philippines at 278 mt/km^2 (WWF and TMO 2009). This is corroborated by the findings of Maypa and Diaz in 2008 that target fish biomass ranged from 45.7 to 134.3 kg/500 m2. This suggests that the total reef fish standing biomass of target species in Tubbataha would range from 9,140 mt to 65,140 mt for the total reef area approximated at 10,000 ha, thus, reinforcing the Park's significance.

The mean total fish density recorded in Tubbataha increased to 685.43 individuals/100m^2 this year. The density for demersals, which are more associated with the status of the reef was estimated at 667.83 individuals/100m^2, which is nearly double that of last year. The combined biomass and combined density of families belonging to commercially important fish group such as Acanthuridae, Labridae, Lutjanidae, Scaridae, Siganidae and Serranidae from 1998 to 2009 show an increasing trend. This fish group is mostly territorial and usually one of the first groups to disappear from a heavily fished reef. The increasing trend signifies that fishing activities are absent or very minimal- a good sign of the Park's protection as a no-take zone.



Commercial fish biomass and density at 10m depth plotted from 1997 to 2009. Error bars represent the standard error of the mean.

Socio-economic. This aspect of management is evaluated every two years and evaluation results for last year showed that of the seven indicators applied, only one indicator was indeterminate, the six were positive. The Park management was effectively moving towards the attainment of its objectives: increasing catch per unit effort in Cagayancillo, level of understanding of human impacts on resources improving, per capita income increased by 26% from 2004 to 2007. Number of tourists remain stable in Tubbataha and increasing for Cagayancillo. Formal knowledge generated from studies are disseminated to a wider audience through information, communication and education campaign.

Governance. Evaluation of the Park's governance is done yearly. All of the governance indicators showed positive change in 2009, though areas of concerns were also identified. Resource use conflicts are addressed, the TPAMB and Execom perform their policy function, the TMO is effective in enforcing existing laws supportive of Park rules and regulations, financial resources remains insufficient but core activities are still carried out.

6. INCENTIVES

Economic Incentives

- Promoting economically and ecologically sustainable resource exploitation

  The Tubbataha Management Plan devotes a program on sustainable resource management for Cagayancillo, populated by 6,000 households. Locally managed marine protected areas were established taking Tubbataha as a model. From being a source of pressure on the resources in the Park, Cagayancillo now serves as a buffer to TRNP. At a larger scale, TRNP is the source of fish and coral larvae seeding the

fishing grounds in the greater Sulu Sea, specifically in the eastern coast of the mainland Palawan. This involves about 200,000 fishing households with members averaging five.

- Green marketing of products and services from the MPA

  Dive tourism in Tubbataha generates $80,000 to $110,000 a year from conservation fees, for about three months operation-March, April, May. Weather for the rest of the year restricts tourism. A business plan formulated in 2007 aims to promote Tubbataha as the premier diving destination in the country and capitalizing on its World Heritage status. Promotion of the Park for non-divers was also initiated by WWF-Philippines through the World Heritage Expedition package, stringing 3 World Heritage Sites (Underground River of Puerto Princesa, Tubbataha, Miag-ao Church) and Cagayancillo for a complete adventure cum educational experience.

- Fair sharing of economic costs and benefits

  Dive operators and tourists pay conservation fees to ensure that the values of the park are maintained and so that dive tourism may continue. Cagayancillo residents have foregone access to the Park but in return receive financial and technical support for the management of their own resources. The costs borne by the government enables it to deliver a healthy environment to its constituents. Grants and donations from private sector and those facilitated by NGOs help fulfil corporate/organizational responsibilities but also expand the reach and scope of the educational value of the Park to other areas where these entities operate.

- Providing economic compensation for restricted users for profits foregone

  The residents of Cagayancillo historically used the park for part of the fishing season but have given up this access. In return the TPAMB approved the provision of 10% (increased from 7% in 2007) of conservation fee collection for livelihood development in Cagayancillo. This fund is managed by the Municipal Government and has partly served as their leverage for additional funds in facilitating a more comprehensive program on Coastal Resource Management (CRM) for the municipality. The CRM adopted the Environmentally Critical Areas Network (ECAN) zoning under the SEP Act and MPA as management strategies.

- Promoting alternative livelihoods

  To support the socio-economic needs of the residents in Cagayancillo, components on micro-finance, adventure-ecotourism, and information and education are made part of the CRM design. The microfinance facility is run by a local people's organization in Cagayancillo providing capital for small businesses among residents of the islands. Cagayancillo is being promoted and gaining popularity as an adventure-ecotourism site and this brings new source of revenue for the municipal government in the form of user fee. The municipal ordinance requiring P300/visitor/entry was passed by the Municipal Council in 2007. Alternative livelihood options reduced pressure on specific marine resource.

- Improvements in local infrastructure and living standards

  There were years when the Municipal Government of Cagayancillo was allowed to invest part of their 10% share from Tubbataha conservation fees to roads and improvement of public facilities.

- Funding from private or NGO sources to promote the effectiveness of the MPA

  In partnership with local and international NGOs (WWF-Philippines, Conservation International, Walton Family Foundation, Petron Corporation, CCEF, Homeland Foundation Jaeger LeCoultre, World Heritage Center-UNESCO, Rotary Club), additional funds have so far sustained Park management operations to about 60% of the annual budget averaging US$250,000.

The economic incentives serve as the pillar of governance of TRNP. They balance the Park's no-take policy and provide the platform to generate the financial resources as well as institutional the institutional partnership needed to sustain the management of TRNP. These incentives can be improved in combination with interpretative incentives by promoting the ecological and tourism values of the Park.

Interpretative incentives

- Public communication, education and awareness raising

  The park has been very successful using the "New7Wonders of Nature" http://www.new7**wonders**.com as a campaign vehicle for promoting the MPA. Regular dives with high profile persons is also very helpful. The President of the Philippines together with some of her cabinet members and media groups dive annually in the Park.

  Information, communication and education campaign in local schools, communities and organizations improve awareness and enlarge constituency not only for the Park but for marine conservation in general.

- Promoting recognition of the potential benefits from well-managed MPAs

  Conservation benefits from the Park are made known to the public through the conduct of fora with local stakeholders on results of scientific studies i.e. larval dispersal and oceanography, monitoring of the status of the reefs and other marine life, and contextualizing these in the light of pressing issues on health, poverty, and climate change.

  WWF-Philippines launched a Summer Fellowship programme in Cagayancillo. This involves students from various universities in the Philippines and community members in jointly demonstrating best coastal resources management (CRM)/marine protected areas (MPA) practice in Cagayancillo and Tubbataha, thus promoting the areas as living laboratories for learning and as models for replication in other similar sites.

Instilling the values of the Park and the rationale of protective measures to a wider audience becomes instrumental in encouraging stakeholders and partners to support park management and increase compliance to Park rules. Designing campaigns for specific target audience can improve the effectiveness of these incentives.

Knowledge incentives

- Maximising scientific knowledge to guide/inform MPA decision-making

  Applying the precautionary principle, the TPAMB delineated a buffer zone of 10 nautical miles from the boundaries of the Park. This is now incorporated in the Tubbataha Bill which is hoped to be passed into law within the year. This buffer zone is primarily designed for the protection of marine wildlife specially cetaceans and fish larvae from the potentially adverse effects of offshore oil exploration and navigation of domestic and international vessels in the vicinity of the Park. Studies and experiences in other areas were used to justify the establishment of this buffer zone.

- Promoting mutual respect and collective learning between different knowledge owners

  Methodologies applied in research, planning, monitoring and evaluation have been designed to maximize the advantages of scientific and participatory principles. Standardized resource monitoring protocols are worked out between and among the different research groups working within the Park.

  A participatory approach to management effectiveness and evaluation of the CRM engaged the local residents of Cagayancillo and this proved to be effective to generate information first-hand and use the information for adaptive management planning. The scientists were engaged to act as mentors not only to integrate the principles of science with traditional knowledge but to guide the process of learning as well.

- Developing mechanisms for independent advice/ arbitration

  The Protected Area Management board is already a sound arbitration panel and its multi-sectoral composition provides a platform for good governance. The PCSD, who presently chairs the TPAMB and implements the SEP, has jurisdiction over administrative cases filed by the TPAMB. The DENR, on the basis of a written opinion from the Supreme Court whereby it should provide suppletory function to SEP, provides a channel for arbitration of conflicts.

Providing credible and well documented reports on Tubbataha have increased knowledge and had a major influence on decisions of the TPAMB, partners and stakeholders to manage the area. A research agenda relevant to specific management issues can be further promoted to partners, particularly in the academe, to ensure that informed decision-making processes will continue.

Legal incentives

- International-regional-national-local regulatory obligations that require effective MPA conservation

  Other than the Presidential Proclamation establishing the Park, there are several national laws supporting the enforcement of TRNP rules and regulations, such as : the National Integrated Protected Areas System (Republic Act 7586), the Strategic Environmental Plan for Palawan (R.A. 7611), the Local Government Code (R.A. 7160), Fisheries Code (R.A. 8550), and the Wildlife Act (R.A. 9147).

- Clarity and consistency in defining legal objectives of MPAs

  The enforcement team with composite membership from the Philippine Navy, Philippine Coast Guard, TMO and the Cagayancillo sea guards operate following a clear enforcement protocol respected by the mother agencies. This enforcement protocol is periodically reviewed and improved together with the rangers, the prosecutors and legal advisers.

- Effective judicial system for penalising transgressors

  Criminal cases are filed in the courts. The TMO, the TPAMB members, and even the Chairman who is also the Provincial Governor, are not allowed to negotiate for and in behalf of the accused and to intervene in the judicial process. Media exposure and strong NGO support at the local and international scenes are instrumental to this. The use of alternative dispute resolution (ADR) for administrative cases is resorted to under the PCSD Adjudication Board.

  Strong support from prosecutors and legal counsel and adequate enforcement equipment are provided to ensure that illegal users are brought to court.

- Provision of financial and institutional resources from the state for MPA governance, particularly law enforcement;

  Contributions from the National Government have always been in kind i.e. manpower and logistics provided by the Philippine Navy and the Philippine Coast Guard. This year, the DENR appropriated $250,000 for TRNP. The Provincial Government provided about $85,000. The Department of Agriculture gave PhP1M for the extension of the ranger station in 2007. All these are channelled through the TMO thereby ensuring implementation of activities in consonance with the approved work and financial plan.

Several laws provide the legal framework of Tubbataha. The formulation of internal guidelines, procedure and protocol to harmonize applicable provisions of existing laws was most helpful in simplifying, clarifying and making more practical the enforcement procedures. Passage of the Tubbataha Bill into law will greatly improve the legal position of Park management.

Participative incentives

- Participative governance structures and processes such as stakeholder committees, stakeholder consultations, participative GIS planning, etc

  The TRNP Management Plan specifically indicates that participatory mechanisms shall be used in the formulation of specific plans and in the evaluation of results. The Management Plan itself went through a series of consultations with representatives of the Local Government, communities of Cagayancillo, and other stakeholders. Participatory evaluation is undertaken as part of an adaptive planning process. Research, information and education campaign are oftentimes a collaboration of several organizations. The TPAMB with its multi-sectoral membership and concensual decision-making process allows for participative governance.

- Transparent participation and decision-making processes

  Rules and regulations for the park were developed with the diving community and have always been published for information of the general public. Lines of communications with various stakeholders are kept open so that inputs may be given to TMO at any time. The Tubbataha Bill which was formulated through several consultations at various layers of the social and government structure in the Philippines may become a template for other marine protected areas in the Philippines.

Encouraging the community of local stakeholders to participate in the initial planning of the Park has proven to be a key element of success because this group consciously decided to forego their fishing access in Tubbataha. If this decision had been forced, the resistance to enforcement may have been greater than it is today. Consistent practice of participative processes can effectively facilitate the sharing of resources including revenues among the Park's stakeholders and partners.

Role of NGOs

The NGOs played a big role in honing the present leadership of the Park under the government structure. The NGOs facilitated the development of management systems to support the long-term vision of TRNP. This came in the form of funding, technical assistance, and networking.

Equity

It was important that the TPAMB recognized the foregone opportunities of the Cagayancillo fishermen when the no-take policy of the Park was fully enforced and negotiated for the sharing of tourism revenues as a compensatory mechanism. This share may be perceived by many as not enough but it helped the Cagayancillo residents to claim co-ownership of the vision to conserve Tubbataha and take pride in it.

7. KEY ISSUES

The TPAMB and the TMO are at this point effectively managing TRNP and efficiently too, considering the limited resources with which they operate. The key issue is building the capability to sustain this level of effectiveness in the long-term by raising at least 2-year contingency fund and having the Tubbataha Bill passed into law. Both of these solutions will mean maximum application of economic, legal and participative incentives by the TPAMB and TMO. Knowledge and interpretative incentives will be useful in engaging the involvement of stakeholders and partners.

Ha Long Bay World Natural Heritage Area
Governance Analysis

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1. CONTEXT

Name: Ha Long Bay World Natural Heritage Areas (HLB WHA)

Size of MPA: 1,533 km^2

Coastline length: 250km

National context:

Population per km^2: 263 (2007)

Population growth rate: 0.977% (2009)

Per capita GDP (PPP US$): $2,800 (2008 est.)

GDP growth rate: 6.2% (2008 est.).

GDP Composition by Sector**:** Agriculture (19%), Industry and Construction (42.7%), and Services (38.4%).

Labour force by occupation: 47.41million (2008 est.): Agriculture: 55.6%; Industry: 18.9%
Services: 25.5% (July 2005)
Unemployment rate: 4.9% (2008 est.)

The Ha Long Bay region*:* Ha Long Bay, located in the province of Quang Ninh, in the Gulf of Tonkin, is a large bay with a multitude of limestone rocks emerging from the Hon Gai Sea. Islands made from schist rise from the Cam Pha Sea and a limited number of earth islands are formed from decayed laterite mountains. Numerous caves and grottoes are found, with stalactites and stalagmites. The earth islands are inhabited.

In 1994, when Viet Nam nominated Ha Long Bay for inscription as a World Heritage Area, the nation assumed a formidable task. In an area already wrought with development pressures and potentially tenuous conflicts in resource use, leadership took on the added responsibility of conserving and promoting vulnerable natural heritage values in a manner befitting an internationally recognized property.

Ha Long Bay with it size of 1,533 square kilometres is located in the North Tonkin Archipelago, off the northeast coast of Vietnam. It is comprised of almost 2,000 limestone karst islands and islets, of which 775 are included in the core zone of Ha Long Bay World Heritage Area. The core zone covers an area of 434 square kilometres.

Ha Long Bay is an important site both economically and culturally for Vietnam, and has played a significant role in the development for the country as an international tourism destination. It is one of Vietnam's premier tourism destinations. There is currently a national campaign to vote Ha Long Bay as one of the new seven natural wonders of the world.

Ha Long Bay is also a reservoir of biodiversity - many species of plants and animals are uniquely adapted to the Bay environment and are found nowhere else.

The area is a key importance to fisheries management and supports livelihoods of many poor families both directly and indirectly.

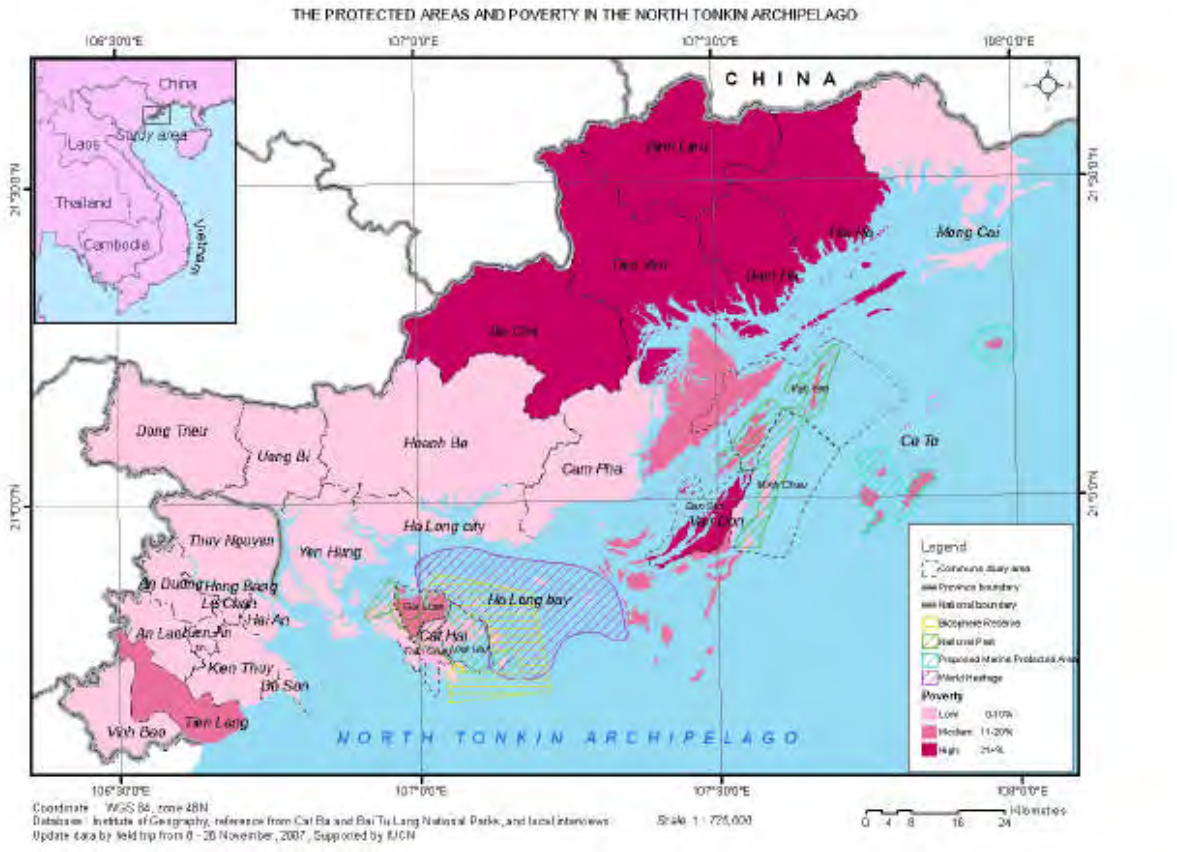

Figure 1: Location of the Ha Long Bay WHA Quang Ninh Province, North Tonkin Gulf

2. OBJECTIVES

Ha Long Bay is not yet consider as an MPA however, the management of HLB WHA with significant marine area. Ha Long Bay Management Department (HLBMD): was established by the Quang Ninh provincial PC's Decision 2796–QD/UB of Dec 9th, 1995. HLBMD directly reports to the Quang Ninh Provincial People Committee (QNPPC) and receives technical guidance and supervision provided by Ministry of Culture, Tourism and Sport (MoCTS) and the National UNESCO Committee of Vietnam. HLBMD has the responsibility **to manage, protect and conserve world cultural and natural heritage values, and promote education and awareness of heritage values among local communities.**

Recently approved **Ha Long Bay Regulation in 2007** by QNPPC issued Decision No.498/2007/QD-UBND promulgating the Regulation concerning the management of Ha Long Bay. This is a particularly timely and important legal document designed to meet the demands of the management of Ha Long Bay in the current situation.

Approval Decision in 2002 by the Prime Minister of the Government on "***Planning on Conservation and Development of Ha Long Bay World Natural Heritage's value to the year 2020"*** is the highest legislation that HLBMD is using at the moment for the operation management with long term vision divided in different period:

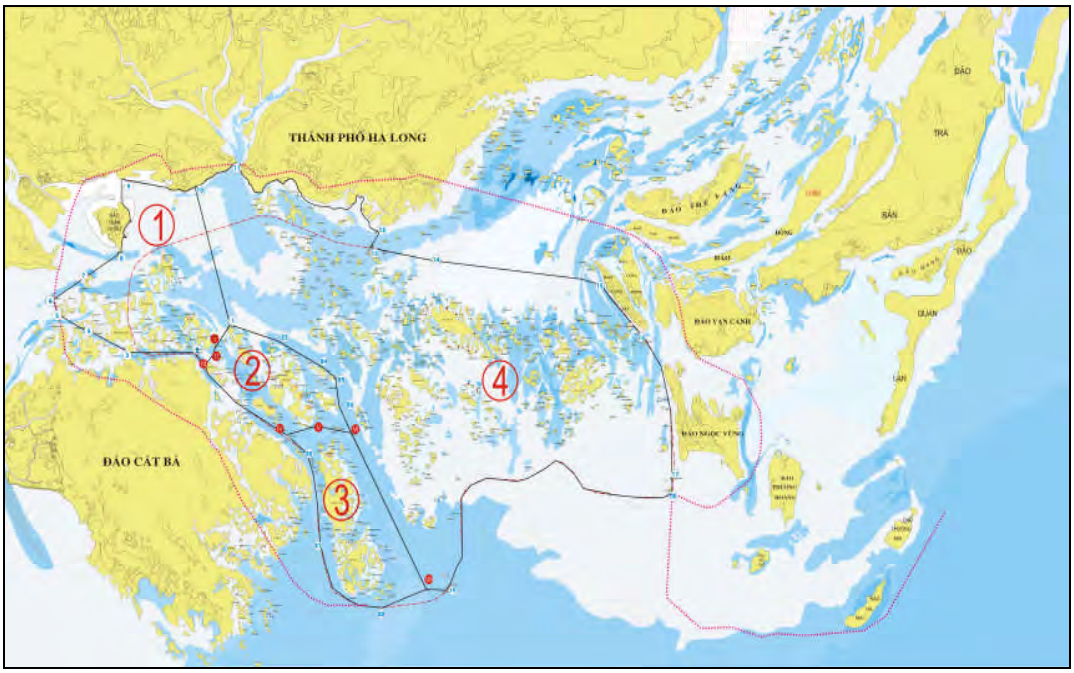

Figure 2: Zoning of the Ha Long Bay in 04 areas (within the core zone)

Operational management objectives: *To ensure the integrity of Ha Long Bay's values, especially the outstanding universal values, which are recognized by UNESCO.*

(1) Core zone: must be protected in a pristine state, with the values of landscape, geology, environment and ecosystems remaining unchanged, the negative impact of human activity on the Heritage values must be minimized. (*core zone include zone number 1,2,3,4 in the figure 2)*

(2) Buffer zone: (a) the offshore water area: the requirements for conservation are the same as for core zone; (b) On the mainland: all buildings to be constructed must have a suitable architectural design, contributing to the beautiful scenery of Ha Long Bay. The development of socio-economic activities and national security must contribute to the protection of the Ha Long Bay's values as a cultural and geologic – geomorphologic landscape, environment and eco systems;

(3) Transition zone: all of the socio-economic activities operating on the Bay have to strictly comply with the current Law and this Regulation and will implement the commitment not to cause negative impacts to the scenery and eco- environment of Ha Long Bay.

3. DRIVERS/CONFLICTS

Development trends: The province of Quang Ninh holds the largest coal reserves in Viet Nam and boasts a large open-cast coal mine. Quang Ninh is also the site for a large new container port in Cai Lan, and related industrial developments. The city of Ha Long is a major, rapidly expanding urban centre. Tourism is increasing and tourism infrastructure is developing at a fast pace.

The local population makes its living in and around Ha Long, which is also a major centre for fishing, agriculture and maritime transport. Steps have been taken to open new ports, factories and housing on the shore in line with a long-term economic development program for the province.

Biodiversity values: There is diverse flora throughout Ha Long Bay, and primary tropical forest is found, mostly on the islands of Ba Mun and Cat Ba. In 1999, a study of the flora of the limestone mountains in the bay discovered seven new plant species, and it is expected that a more detailed survey will throw up many

more new discoveries. Preliminary surveys also indicate the presence of many different fish species, and mammals, reptiles and birds are found on the islands, especially the earth islands north of Ha Long Bay.

The principal environmental values of Ha Long Bay are the scenic landscape values, geological interest, biological diversity, especially in marine species, and archaeological remains.

Historical and Cultural values: Numerous archaeological sites have been found and at Giap Khau (Hon Gai) there is evidence to suggest occupation by the Hoa Binh Culture, some 10,000 years ago. In 1962, the Minister of Culture established the area as a historical and cultural relict and national scenic spot.

World Heritage listing: In 1994 the area was inscribed on the World Heritage List, meeting Criterion (iii) for natural areas under the World Heritage Convention, which relates to exceptional natural beauty and aesthetic importance. In November 2000, once again, Ha Long Bay was recognised as a World Natural Heritage area according to criteria (i) for geological and geomorphology values.

Visitation Patterns: The World Heritage Area is a popular tourist destination with an estimated 1,700,000 visitors in 2008, half of whom are foreigners. The declaration of Ha Long Bay as a World Heritage Area has confirmed the unique value of the area. Yet - Quang Ninh is part of the northern development triangle, and is therefore also seen as an area for industrial development and urban expansion.

Tourism development is building on that asset, but this industry in itself carries risks, unless the activities are well managed. Increased numbers of visitors can lead to litter pollution and actual damage to the area through overuse. Tourist boat transport needs to be planned and managed, in order to avoid accidents, spills and water pollution. More visitors to the HLB WHA will require more staff for the department.

Deepwater ports in Cai Lan and Cua Ong both areas impinging directly on the HLB WHA. New, larger ports will increase the potential **impact of shipping**, including grounding, fuel spillage, cargo spillage, collisions, aesthetic impact on visual amenity. This is particularly critical as the main shipping routes go through the HLB WHA core zone.

Coal loading operations of over 10 million tons per year were recently moved from Ha Long City to Cam Pha - Mong Duong. Yet, barges still carry coal to waiting ships through the inshore waters of the Bay, and sediment from the mining and storage areas enters coastal waters. The shipping routes to the new port go through the HLB WHA.

A serious potential negative effect on the Bay waters is the substantial **sedimentation,** which is a result of uncontrolled forest clearing in the hinterland to service the mines and timber industry. The sediment may damage the coral and other aquatic biodiversity, but also affects the visual impact of the bay.

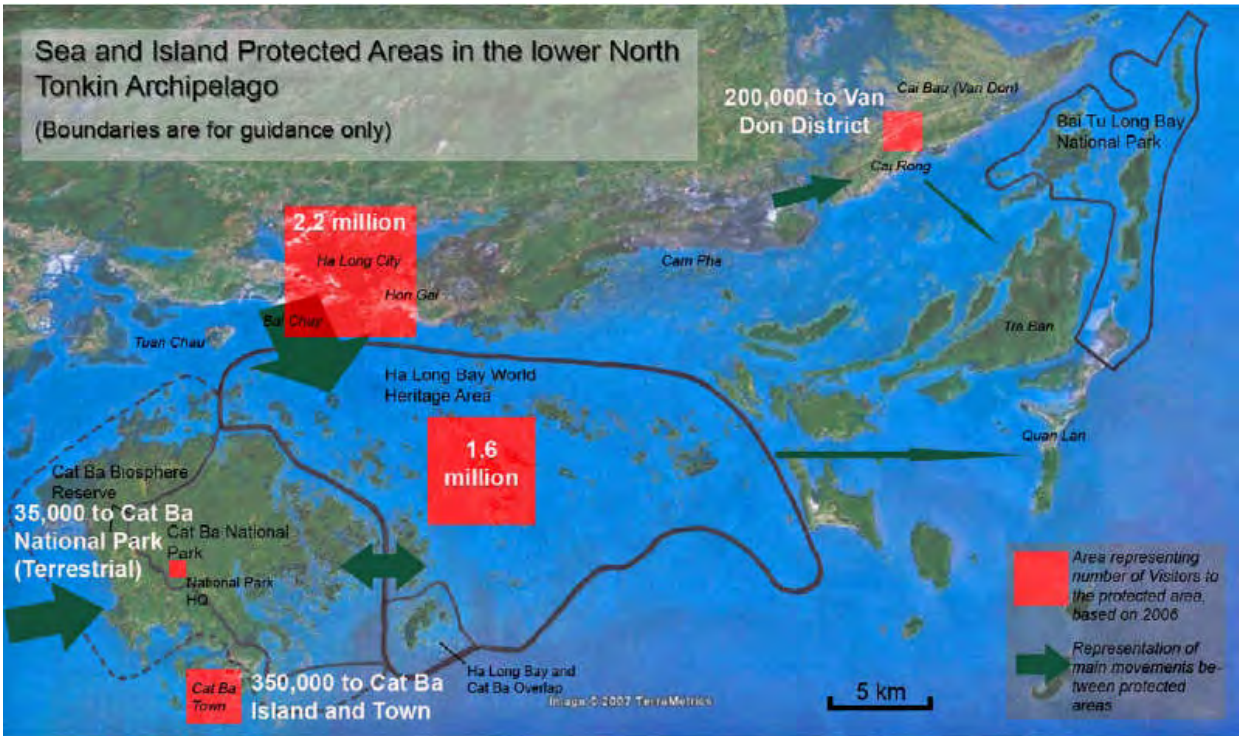

Figure 3: Relative tourism distribution in the protected areas of the lower North Tonkin Gulf Archipelago. Ha Long Bay World Heritage Site combined with Ha Long City receives most visits annually. (Adapted from Google Earth Image).

Boundaries shown represent core zones only. For the purposes of this report, reference to Ha Long Bay World Heritage Site and Area refer to the core zone depicted here. Ha Long Bay's buffer zone extends into Ha Long City, covering the urban settlements of Hon Gai, Bai Chay as well as Tuan Chau and part of Cat Ba Island. Note the overlap area of Cat Ba National Park and Ha Long Bay.

There is a large ***fishing*** effort in Ha Long Bay with some fishing communities living in 'floating villages' in the Bay itself. Unacceptable fishing techniques, using dynamite and poison are still used, and there are also indications that the available fish stock is decreasing due to over-fishing. Partially as a result of reduced fish catch, but also due to increased demand from visitors, some fisher folk have started to sell **coral** that they collect from the reef. This will eventually lead to destruction of the reefs, and that would signal the beginning to the end of the fishing activities.

Because of the availability of limestone, clay and other construction materials, Quang Ninh Province has established significant cement and brick manufacturing **industries**. These and other industrial developments have impacts on the HLB WHS through, for example, airborne pollution, polluted run-off from and sedimentation.

Urban development is also a contributor to impacts on the waters of Ha Long Bay through sewage discharge and litter and waste production. More immediate threats are caused by land reclamation, which is needed to create space for new construction. Land reclamation is particularly threatening for the remaining mangrove forests of Quang Ninh.

Many of these activities, as currently managed, are in direct conflict with efforts to sustainably manage the marine resources and HLB WHS values of Ha Long Bay. They are issues that must be addressed to maintain the values of Ha Long Bay as a world heritage area and as an area in which local communities can satisfy their

livelihood and recreation needs. In the long run, an integrated development plan for the whole of the North Tonkin Archipelago has to be prepared, but the most immediate requirement is to strengthen the capacity of the HLBMD.

4. GOVERNANCE FRAMEWORK/APPROACH

The Quang Ninh People's Committee established the HLBMD on 9 December 1995. The HLBMD started off as a small unit but has grown to an institution with 290 members of staff in mid 2009. The Department is responsible for the protection of the values of the World Heritage Area and for overall management of the area, including the exploitation and use of the resources.

Prior to establishment of the Ha Long Bay Management Department, there was no single authority equipped with sufficient cross-sectoral perspective, personnel resources, or technical knowledge to manage the site in keeping with standards befitting a property of international acclaim. With management duties parcelled out among administratively isolated departments, there was no clear mechanism to harness and galvanize the pieces of a management framework that did exist. And with relevant organizations responsible to fulfil duties far beyond World Heritage management, there was no guarantee that such concerns would receive ample attention or rise to the forefront in decision-making.

Despite the remarkable achievements that the Department has made during the last 14 years of its existence, it is generally accepted that HLBMD has not had the resources or the status to develop strategically. The HLBMD has already identified the overall management weaknesses that must be addressed in fulfilling its role effectively.

The current organizational structure is not best suited to deal with them. For example, there are relatively large number of staff involved in cave and grotto management while only a small number involved in day to day management of on-water activities and a small number of qualified and experienced planning staff and other necessary technical personnel.

The major institutional issue that the HLBMD itself has identified is the lack of adequate strategic direction and institutional analysis, which would allow HLBMD to develop a structure and legal mandate appropriate to the range of issues identified in this report.

Other apparent issues include lack of project management and monitoring skills, limited policy and technical skill levels and inappropriate management structures and techniques.

There is very little current formalized staff training being conducted within the HLBMD, there is a small training program but it is not delivered in any systematic way. There has been some research into a number of areas including landscape and biological values and basic training in planning, report and document preparation. Field management staff (ie the checking team) have had some training in current laws and regulations and management of environmental activities but this has been introductory and requires strengthening through a more focused program.

The HLBMD currently with more than 300 staffs has structured in 13 divisions dealing with administration and tourism guidance; management and marketing that include: Main Office, Inspector, Finance and Planning, Professional and Research, Projects Management, Eco- Museum, Technology and Equipment, Enforcement Team, Rescue Team, Centre of Van Canh Park Conservation, Cave and Grotto Conservation Team, Cultural Conservation Team, Centre of Conservation and Recreation.

The ability of the HLBMD to carry out many of its functions could also be enhanced through access to appropriate technology for information and data management to allow well-informed decision-making. Currently information and data management is limited and in its initial stages. The development of skills and capacity in database management and information/data presentation through technology such as geographic

information systems is needed.

Finally, it is clear that there would be significant benefit to all staff within the HLBMD if they were able to consider themselves part of the wider international World Heritage 'family' through networking opportunities, conferences, study tours, WHA training and visits by other WHA managers to Ha Long Bay. This would provide significant opportunities for increasing skills and knowledge and sharing these with other managers while at the same time learning from others.
There are significant gaps in the HLBMD ability to fulfil its role and functions.

5. EFFECTIVENESS

Issues related to floating village in the core zone of Ha Long Bay WHA

HLBMD coordinate closely with the relevant department to consult and propose to QNPPC to issue the regulation on management and adjustment for fisherman in the floating village.

Resolution No 09-NQ/TU issued by Quang Ninh Provincial Party on the management conservation and development of the values of the Bay, it requires Ha Long City to make a plan to implement the project of moving fisherman to the main land; not allow them to build more floating house on the bay without permission; issuing policy to assist them to build houses in the mainland; A certain number of fisherman can be allowed to live on the bay for the tourism services and preserve of the cultural identity of the floating village; reorganising floating fishing village on the Bay; establishing regulation for fishing village in accordance with culture and tourism standard;

Issues related to development projects in the coastal areas of Ha Long Bay

The QNPPC has made great effort to minimize the pressure on the Ha Long Bay environment: (1) Not approval for the new sea expansion and waste disposal project; all project must comply strictly with the regulation on the environment protection during the implementation process; QNPPC will revoke the operation license of the ineffective project; (2) Adjusting the scale of some project in order to minimise the pressure on the Ha long Bay environment (e.g. narrowing the scale and the area of the Ha Long Boat Building Company; rearranging and moving small port for goods transport to the regulated areas; upgrading these port to be in the harmony with the natural scenery and environment protection; (3) Construction and tourism development projects in the coastal area of Ha Long Bay must be considered and re-planned to ensure the aesthetic value and scenery environment of the heritage; (4) To extend tourism space to minimise tourism pressure in the core zone of the WHA (e.g. opening new tourism sites; developing eco-tourism project on the islands in Bai Tu Long, Van Don, Quan Lan, Co To.. as well as developing new tourism activities that is friendly with the environment;

Integrated coastal management approached

The formulation of new policies and institutions to manage Ha long Bay should be based on an integrated approach. This will allow the planning tools to reflect the needs of the Bay most effectively. All new policies or management tools should be in line with the regulations of the local area and link these conditions with requirements of the management board; and there should be high levels of community participation throughout the process.

The current policy context contributes to a weaker HLBMD and weaker sustainable management of the Bay overall. Proposed policy changes to revert this situation are:

- Give more management rights to the HLBMD;
- Designate specifics management objectives for specific areas/zones of the WHS;
- Establish public / private partnerships on the HLBMD to take overall responsibility to make decisions to multiple sectors;

- Establish multiple cooperation and procedures in giving decision making powers to the HLBMD;
- Develop and implement a supervision and assessment period regarding the status of Ha Long Bay;
- Establish pilot sites for small-scale fishing co-management; and
- After 2010, extend the WHS to include Bai Tu Long and establishing a Management Board as cluster approach. Beyond 2015, expand the WHS to include Cat Ba and Tran Island.

6. INCENTIVES

Economic incentives

- *Promoting sustainable fisheries*

  The most popular fishing gear types are gill net, long line, lift-net push net (illegal) and traps. Most landings are consumed or sold locally. Inshore fisheries have been severely depleted, putting pressure on high value fish stocks and increasing catches of lower value fish resources. With increasing population pressure and the development of more effective (and destructive) fishing gears, inshore resources have been increasingly over-exploited. Many fishers have abandoned inshore fishing or have resorted to catching small species with fine mesh nets. There is also a tradition of catching and collecting fishery resources from the beach, shallow mangroves, estuaries lagoons and river deltas.
  Cage culture of marine fish is developing quite rapidly in Ha long Bay and near by areas. The region also has 30 shrimp hatcheries and several marine fish hatcheries. Although aquaculture is considered environmentally sustainable, it does pose concern associated with quality management, including carrying capacity of sea and inland water areas, extension services and marketing channels. More emphasis could be placed on aquaculture as sustainable livelihood and a mean to alleviate poverty.
- *Promoting the 'green marketing' of tourism*

  Shifting tourists from Ha Long Bay to other areas in the region, such as Cat Ba and Bai Tu Long National Parks would relieve tourism pressure on the core zone of the World Heritage Area and provide much needed revenue to these other areas. Ha Long Bay could serve as the focal point for collaborative tourism activities in the North Tonkin Archipelago with a sustainable management strategy for Ha Long Bay serving as a guideline for Cat Ba and Bai Tu Long National Parks. Additionally, tourists could be encouraged to visit local cultural centres and museums located outside the core tourist zone in the bay.

  An improved understanding of the expectations and needs of tourists that visit Ha Long Bay as well as training about the environmental significance of the bay for stakeholders in the Vietnamese tourism industry would increase the quality of tourism in Ha Long Bay. Building the capacity of tour operators to adhere to environmentally friendly tourism practices such as non-landing tourist activities and clearly communicating the environmental and cultural significance of Ha Long Bay to visitors would improve tourism quality. A certification system that recognizes environmentally friendly and high quality tour operators could facilitate this form of high quality tourism.

- *Promoting alternative livelihoods*

  Increase the fishermen population in the bay, rapid development of industry, urbanisation, transport, tourism, mineral and aquaculture exploitation in HLB create challenges for the management , conservation and development of Ha Long Bay heritage's values.

  Three floating fishing villages (Ba Hang, Cua Van, Cap De) including 385 households with a population of 1,397 people. Their main earning living methods are fishing, seafood cultivation and tourism services. Currently solid waste from floating villages is collected and treated but there is no solution for treated liquid waste. Waste food from floating aquaculture activities is also one of the cause pollution of the HLB environment.

  There are guidance from Quang Ninh Province People Committee (QNPPC) of respecting the historical existence of the fishermen the present floating fishing villages; Communicate and enhance the awareness of local community on environmental protection to involve them in heritage conservation activities; and provide fishermen with favourable conditions to develop their economic and culture life on the Bay.

- *Re-investing income through the fees*

  Total income from tourism fees visiting Ha Long Bay (2008) is five million US dollar while 55% of the total income reinvesting to infrastructure for the Ha Long City and promotion activities on tourisms; and 45% of total income managed by HLBMD and support the local community, floating villages and elementary school in the floating village; engaging fishermen from the floating village working as rangers and cleaning up the Bay;

- *Seeking corporate and NGO funding*

  Funding is not a challenging issue for HLBMD; however HLBMD is still seeking for the technical and financial support from UNESCO, IUCN, FFI and other organisations mainly focus on education and awareness.

Interpretative incentives

- *Eco-boat programe*

  The Eco-Boat programme (2005-2008), set out to establish a public/private partnership for environmental education structured on the exploration of HLB WHA and the negative human impacts on it. The programme has achieved its three intended outputs: i) the development of an educational curriculum; ii) the establishment of operational requirements; and iii) the creation of a new private voluntary organisation. The EcoBoat programme have had positive impacts: exposure of programme to over 2,500 local youth; establishment of an operational routine; generation of strong community support and securing the required external funding. Building on lessons learnt over the last three years of programme implementation and taking advantage of the opportunities presented to the EcoBoat programme which include: an enthusiastic and eager audience; a large volunteer workforce from the Quang Ninh Youth Union; and approval from provincial authorities to continue environmental education on the EcoBoat, a set of recommendations are offered.

- *Awareness for decision makers*

  QNPPC and HLBMD with their significant efforts on WHA's development and management through close guidance of the Quang Ninh Province and functional organizations at all levels, the guidelines and principles of the heritage management were realized. The legislative documents relating to the Heritage Conservation are step by step completed and strictly implemented. The coordination in heritage management among relevant organizations is more frequent and effectiveness.

  The increasing of socio-economic activities in World Heritage Area is threatening Ha Long Bay environment. Projects and research works on Ha Long Bay environmental protection and world heritage values sustainable development are being implemented effectively (i.e. IUCN/NOAA/MOFI Project on "Capacity Building on Integrated Coastal Management: Case study in Ha Long Bay"; Eco-Museum Project which focused on floating village communities; and FFI's Eco-Boat Project ..etc.). As a result, awareness and responsibility of the local government and communities have been enhanced. Everybody takes actions for a clean and sustainable development for Ha Long Bay.

Knowledge incentives

HLBMD applied advanced technologies to the heritage management and conservation, such as: remote sensing, Geological Information System (GIS);

Enhanced the coordination with the relevant departments and national and international experts to conduct research on the heritage's values and to cooperate on heritage management and conservation;

Conducted the monitoring of the changes of limestone islands, caves and grottoes; and research on rockside prevention of some typical islets which are considered as a symbol of the HLB WHA;

Advance technology on waste disposal management has been invested for the HLB WHA to enhance the effectiveness in waste management;

The scientific researches, projects development and documentation on the conservation and Heritage's values are being implemented with the strong efforts by the HLBMD with close cooperation and support from national and international organizations;

In hosting various research initiatives, the HLBMD has helped develop a base of technical knowledge about site features and threats that can support future management and provide grounds for affecting the course of decision-making throughout the area;

Legal incentives

- *Enforcement of laws*

With support from QNPPC, HLBMD had developed and provided supplement and complete legislative document relating to the heritage management in order to create legal basic for adjusting and regulating activities in the core area and buffer zone of the WHA; The recently Regulation on Ha long Bay has been approved by the Quang Ninh PPC has supported for the HLBMD to implement it's functions.

In term of environment enforcement and surveillance, inter-organisation inspection team has been established which includes HLBMD, marine police, tourism, aquaculture, transportation departments. HLBMD is responsible for management of the team in order to supervise, identify and strictly punish the violations on the Ha Long Bay; There is application of forbidden illegal fishing method such as cyanide, electricity, poison and mine.

The surveillance team has prevented a range of infringements on the physical integrity of the site by controlling vandalism and illegal harvesting of terrestrial plant and marine life; coral reefs has been protected and rehabilitation in Cong Do area.

- *Adaptive management*

In the past years, coral trading activities on Ha Long Bay and souvenir shops at the Bai Chay tourist station has happened. However these activities were stopped. The HLBMD has taken a lot of effective prevent and deal with and stop this problem. HLBMD coordinated with relevance agency have functioning on surveillance, punishment to punish the violation of the regulations on heritage area management and protection especially coral trading activities (for both buyer and seller);

HLBMD organise WHA protection commitment with fishermen at fishing villages; establish the heritage protection stakeholder network; create more job for fishermen; strengthening communication and education, awareness activities and educate to local people so that they could take part in protection. Up to now, the trading, exploitation of coral basically ended.

Participative incentives

Many trainings has been organised to build capacity for staffs of HLBMD and its relevant departments in order to enhance their management and organisation capacity; Extent the cooperation with local, national and international organisations in order to attract the participation of the communities in heritage conservation and management;

Encouraged individuals and organizations to invest in heritage management activities on the basis of complying with the Vietnamese Law and the International Convention on natural and cultural heritage protection;

Promoted and diversify the communication and public education in order to enhance and change the awareness, consciousness and actions of local communities of the heritage management, conservation and development;

The HLBMD has established a public profile in the stakeholder community and developed important linkages with other relevant agencies;

A variety of marketing and outreach activities have significantly increased public awareness of natural heritage values;

"Os Miñarzos" Marine Reserve of Fishing Interest

Governance Analysis

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1. CONTEXT

Name of MPA: Marine Reserve of Fishing Interest "Os Miñarzos",

Size of MPA: 20.74 km^2

Coastline length: data not available

Distance from shore: 0 m

Population per km^2: 80 people/ km

Population growth rate: 0.072% (2009 est.)

Per capita GDP: $US $34,600 (2008 est.)

GDP growth rate: 1.1% (2008 est.)

GDP composition by sector: *agriculture:* 3.6%, *industry:* 28.9%, *services:* 67.5% (2008 est.)

Labour force by occupation: *agriculture:* 4%, *industry:* 26.4%, *services:* 69.5% (2008 est.)

Unemployment rate: 13.9% (2008 est.)

Government type: parliamentary monarchy

Local context

Lira is a small fishing village with a population of 980 inhabitants, which has experienced a considerable decrease during the last years as a consequence of the lack of generational renewal and migration to the cities. Its economy, characterised by a low development, is mainly based on the artisanal fisheries, agriculture and farming and services.

Lira is located in Galicia (NW Spain), a region with an autonomous government (Xunta de Galicia) in the NW of Spain, with a population of 2.771.341 inhabitants. It comprises an extensive coastline (1295 km) and supports a large number of fishing communities.

The fishing fleet of Lira accounts for 33 small scale vessels used by the 76 fishers. Apart from the boat-based fishers there are also 22 women who work on shellfisheries by hand, under different exploitation plans.

The main species exploited in Lira are the octopus (*Octopus vulgaris)*, spider crab (*Maja squinado),* velvet swimming crab (*Necora puber),* goose barnacle (*Pollicipes pollicipes), shrimp (Palaemon serratus) and sea urchin (Paracentrotus lividus*). These species are harvested with traps, purse seine and by hand in the case of the sea urchin and goose barnacle (from boat).

All the boat-based fishers are included in the local *cofradía*, which is defined by the Galician Fishing Act as *a corporation with legal jurisdiction and decision-making capacity for accomplishment of its aims and functions*.

Every *cofradía* has defined territorial limits of action and there are a total of 64 in Galicia, representing every fishing community.

Their income is provided by the fees paid by the members and for the percentage from the sale of their products in the fish markets, which rounds a 3% of the value of fish sold in first auction and they also receive subsidies from European funds managed by the Fishery Council of the Xunta de Galicia. The *cofradias* act as organs of consultation and collaboration with the Administration of the Autonomous Community.

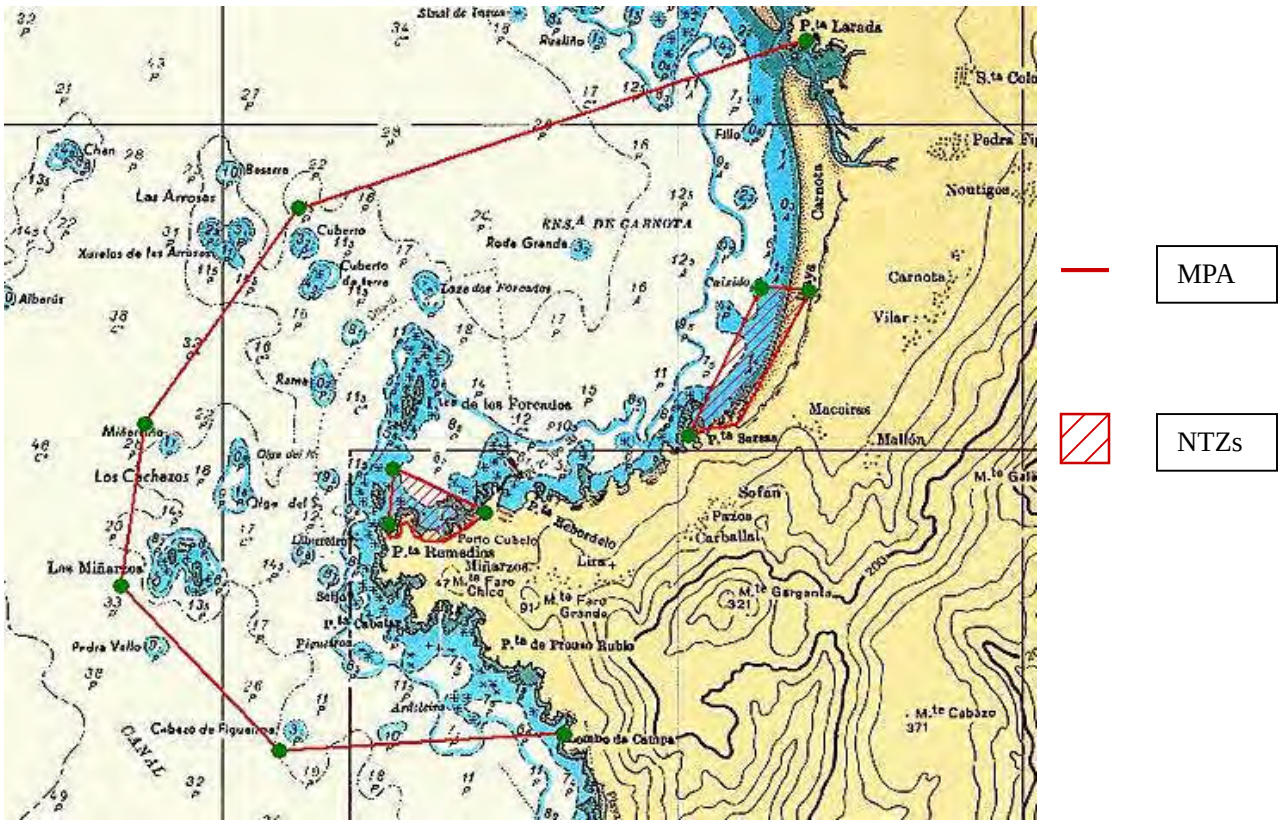

Figure 1. Map of the MRFI "Os Miñarzos"

2. OBJECTIVES

The MRFI "Os Miñarzos" was proposed as a multiple-use MPA classified as type VI of IUCN categories, and it includes two NTZs, category Ia, of 0.79 and 0.61 km^2 respectively, which represents a 6.75% of the total area.

The Decree 87/2007 establishes the objectives of the MRFI "Os Miñarzos" as the following:

- To protect and favour the regeneration of fishing resources.
- To impulse artisanal fishing and sustainable development.
- To conserve and protect the flora and fauna of the marine environment and their diversity.
- To encourage the environmental awareness about marine environment
- To promote fishing and environmental values of Galician coasts. To favour scientific studies about measures of protection of resources and fisheries management.

- To facilitate the development and application of models of fisheries management with the participation of fishers and shellfishers in their design and implementation.

The objectives established in the Decree 87/2007 regarding the wider multiple-use MPA area relate to those described for category VI of protected areas according to IUCN guidelines.

The existence of two NTZs (category Ia of IUCN) aim to preserve spawning and breeding grounds and to increase larval and juveniles export to the wider MPA, having an important effect in the recovery of fish stocks and protection of biodiversity. However, biodiversity data is only being produced from the year prior to the MPA implementation, and, although the area is being monitored, it is also too early to observe any benefits.

The Decree 87/2007 was created under the framework of the Galician Fishing Act 6/1993, which has recently been subject to repeal due to necessary changes in regulations to integrate with current trends in European fishing policies

The Galician Fishing Act (subject to modification from December 2009) regulates all maritime-terrestrial fishing activities in Galicia both professional and recreational, aquaculture and shellfisheries, as well as the Galician fleet, exploitation plans and licenses, commercialisation, research and technological development, sanctions, inspections and control and protection and conservation of fishing resources.

The new Fishing Act incorporates the protection of the marine space by including for the first time MPAs as a means to protect the marine environment. It defines marine protected areas as "*Those areas of special interest for the preservation and regeneration of marine resources and marine ecosystems that support them, that show differentiated conditions for the growth and permanence of fishing resources by their condition of areas of reproduction, spawning, breeding or development of species of fishing or shellfishing interest*".

3. DRIVERS/CONFLICTS

The fishing community of Lira was protagonist of a co-management initiative pioneer in the region when they proposed the creation of the MRFI "Os Miñarzos", the first MPA in the Autonomous Community of Galicia, which was entirely developed by the fishers in partnership with biologists, social scientists, environmentalists and the autonomic government.

Rather than responding to a legal obligation or a national objective, it was proposed as a solution to several problems faced by the fishing community during the last years, such as overfishing, illegal fisheries and the consequences of the Prestige oil spill.

A key factor in the creation of the marine reserve was the partnership capacity developed through earlier collaboration between the fishing community and a team of scientists from University of Coruña (UDC) led by the anthropologist Antonio Garcia Allut and the marine biologist Juan Freire.

Their teamwork started in 2000, when they developed a model of commercialisation of fishing products that gives fishers a more active role by eliminating intermediaries in the selling process. In December 2001 starts Lonxanet Directo S.L., an internet-based company which sells fresh fish and seafood from four Galician *cofradías*, which are partners together with some private investors. Thanks to this initiative, the fishers increased their income by a 30 % (even reducing their catches) (Garcia-Allut, 2003) breaking the monopoly of the usual buyers and stabilising the prices on market.

All this advances were abruptly forced to stop when the Prestige oil spill took place on the 13 of November, 2002. All fishing activity was statutory banned as a precautionary measure. Gradually, the different fishing grounds reopened their activity, however, the area where the members of Lonxanet carry out their activity was severely affected by the spillage, and the recover was very slow.

After Lonxanet, there were other projects developed between both parts aimed to promote sustainable fishing and to encourage fishers to participate in new initiatives with clear benefits in terms of revenue and publicity. Through this teamwork, there was an increase in the *cofradía*'s revenue and self-confidence due to the changes in the commercialisation process and attraction of tourism, which had a clear effect on their openness towards new

initiatives.

The idea of the marine reserve came out in 2002 from conversations between both sides in the course of that previous contact; Lira's cofradia had been concerned for a long time about the state of the fish stocks and the UDC research team had been thinking about using marine reserves as a management tool, and from this interchange of ideas emerged the initiative.

After a couple of preliminary meetings with all the members of the *cofradía* the next step was to invite two fishers from a successful Canary Islands MPA (with the support of Xunta de Galicia), so that they could share their experiences in a meeting with Lira's *cofradía*.

This contact between fishermen was a key factor to overcome the initial scepticism of some of the members, as the locals had the chance to listen to a first-hand opinion of people they felt closer to them. From that moment the project started; it was created a working group and they cooperated through different meetings and workshops in the design of all the aspects related to the creation of a marine reserve, such as size, location, regulations and access.

This process lasted for one and a half years approximately, and once the first summary was ready it was sent to the Galician Administration, which gave its approval.

The NGO WWF/Adena also showed interest for the project and had an active participation on it. Apart from sponsoring the monitoring of the reserve (carried out by UDC), WWF/Adena organised different activities such as workshops with fishers, campaigns of public awareness of the project and a volunteering programme.

Pressures

Prior to the establishment of the MPA, the area was considerably overfished. The modernisation of the fleet in the last 20 years had an important effect in the fishing effort, as well as the return of the locals after a migration movement in the late seventies and early eighties.

One of the main pressures in the area was that due to the activity of poachers. Before the establishment of the marine reserve in Lira, it was of special importance the incidence of illegal fishing (mainly nocturnal scuba divers), especially prior to the Christmas season, when species such as the spider crab and velvet swimming crab reach their higher prices in the market. This illegal activity has a devastating effect in the resources and the fishing community, not only by the depletion of the stocks, but also by the decrease of the prices in market this represents. By selling straight to the restaurant at a lower price, the poachers devaluate the product, saturating the market.

Conflicts

As opposed to the majority of conflicts posed by MPAs, which generate both internal (between uses) and basic (between use and conservation) conflicts (Jones, 2002) the conflicts arose in this case study were only internal, between users.

Fishers from neighbour *cofradías* showed opposition to the MPA. The main cause of disagreement was that to be granted continuity in the census that regulates the vessels allowed to fish in the reserve they have to fish in the area a minimum of days per year. The census is the most controversial part of the new regulations as it represents a means to restrict the access to the reserve while it gives territorial user rights to the fishers who remain inside, which are, in the practice by their proximity, the fishers form the village.

Another stakeholder group showing opposition to the marine reserve is the Galician Federation of Sub aquatic Activities (FEGAS), given that the new regulation applied to the marine reserve prohibits submarine fishing whilst allows the activity of anglers. In their opinion, such measure is discriminatory towards submarine fishers, which, unlike poachers target only finfish, by snorkelling.

4. GOVERNANCE FRAMEWORK/APPROACH

The Marine Reserve of Fishing Interest Os Miñarzos (MRFI) is managed under the authority of Xunta de Galicia,

the government of the Autonomous Community of Galicia.

Spain is territorially organised in 17 Autonomous Communities with their own regional governments responsible for education, health, social services, culture, urban and rural development. All of them have their own elected parliaments, governments, public administrations, budgets, and resources.

This type of organisation involves the decentralisation of legislative and administrative functions. Regarding the environment, and especially the protection of the marine environment, the national administration has exclusive responsibilities in the elaboration of basic legislation. The Autonomous Communities can carry out and expand this legislation (Suarez de Vivero and Frieyro, 1994).

The riparian Autonomous Communities have exclusive responsibilities over maritime fishing within interior waters. When an area spreads over both jurisdictional ambits it is administered jointly by both administrations.

Os Miñarzos MPA lies within internal waters, which grants the right to be entirely managed by the Autonomous Community of Galicia.

The MPA was designated by the Fisheries and Maritime Affairs Council (now Council of the Sea) of Xunta de Galicia, following a proposal by the local fishing community in partnership with scientists from the University of Coruna and the NGO WWF/Adena. Once the proposal was accepted, it was made official on release of a legal document, Decree 87/2007 12 of April 2007 by Xunta de Galicia. A management body was appointed shortly after, with the following structure:

-3 members of the regional fishing authority
-1 member of the regional environment authority
-4 representatives of the fishing sector (2 from Lira's cofradia and 2 from the Galician Federation of cofradias)

The creation of this mixed group which is jointly represented by members of the Administration and the fishing sector in equal numbers sets a precedent of co-management with a participatory approach.
The management body has a strong power, allowing full control and administration of the MPA, regulation of the users' activities, and being also responsible for the enforcement of the regulations existing within the area.

5. EFFECTIVENESS

Uses permitted within the MPA

- **Multiple use area**: allows professional and recreational fishing with more restrictive regulations than in the open area
- **NTZs**: the only permitted activities are those of sampling with scientific or monitoring purposes

Under the new MPA legislation sub aquatic fishing is no longer allowed, as a measure to control the activity of poachers

The main pressures in the area (overfishing and the action of poachers) are being addressed through the new normative that controls fishing effort, prohibits sub aquatic fishing and increases surveillance within the area:

The action of poachers has been virtually eliminated.

Given that the MPA was established in 2007, it is too early to observe significant effects in the recovery of the fish stocks.

Effectiveness scale: 3 (Some impacts completely addressed, some are partly addressed).

6. INCENTIVES

6.1 Economic incentives

- Promoting economically and ecologically sustainable resource exploitation

Expected benefits of the MPA are the increase of revenue by the renewal of fishing resources and the boost of tourism given the attention received in the media since the creation of the marine reserve.

- Green marketing of products and services from the MPA

The village of Lira has already started promoting green tourism since the creation of the marine reserve has generated considerable public attention.

- Allocation or reinforcement of community/user property rights

Limiting the access to the MPA was considered crucial to obtain an overall reduction of the fishing effort in the area.
It was decided to introduce territorial user rights for fishers (TURFs), for those fishing within the MPA. Such rights refer to the right to exploit a resource in a particular area rather than an ownership, and they cannot be sold.

To implement this new measure it was created a census in which fishers need to register to have the right to use the area. Such census is object of periodical renewal and it is required to fish in the area a minimum of days per year in order to keep the membership. By this means a limitation of the access can be granted in a gradual manner causing less conflict than in the case of restricting the use to only fishers from the village.

- Protection from incoming users

The permanent surveillance of the MPA has practically eliminated the action of illegal fishers.

- Funding from private or NGO sources to promote the effectiveness of the MPA through the use of various incentives

The NGO WWF/Adena participated actively in the implementation process sponsoring the first biological monitoring programme (together with some private investors), which was conducted from January to December 2007.

Economic incentives have been a key factor to gather support amongst the fishers in a community that was seeing their livelihoods threatened by the decline of their resources.
Providing further education and training in business administration and logistics to the fishing sector would maximise their revenue.

6.2. Interpretative incentives

- Public communication, education and awareness raising on the importance/vulnerability of marine ecosystems and the benefits of the MPA

The creation of the marine reserve Os Miñarzos received important media coverage prior to its establishment. It occurred at a time when the public was still concerned about the effects of the Prestige oil spill and the vulnerability of the marine environment; hence the initiative was welcomed as a measure to protect the sea. The

involvement of WWF/Adena also contributed to gain support of the general public.
Part of the teamwork between the different stakeholders promotes traditional fishing values and communication between the fishing sector and society. To promote these values and those of sustainability of fisheries they developed different initiatives, such as fishing workshops for schools and the general public and international networks of artisanal fishing communities to encourage sustainable fishing.

- Promoting recognition of the potential benefits from well-managed MPAs

The potential benefits for the exploitation of resources, particularly those due to the permanent closure of NTZs to the fishing were explained to the users from the earlier stages of the process.

It was in all stakeholder's mind to draw public attention about the marine reserve to increase its popularity and also to encourage the spread of these initiatives and give one more step towards establishing networks of marine reserves.

This objective is being fulfilled at a fast pace, as Lira's precedent has prompted other fishing communities to develop new proposals. Shortly after the creation of "Os Miñarzos", it was proposed another MPA, of 720 Ha in the village of Cedeira, which was approved in January 2009.

Another proposal followed soon for Celeiro, this one much larger and more ambitious, as it extends outside interior waters, with a total of 7100 Ha.

Given the success of marine reserves amongst the fishing sector, the General Direction of Marine Resources from Xunta de Galicia is currently studying four new proposals in Aguiño, Camelle, Sada and Coruña. The creation of these new reserves, seven in total, would make Galicia the autonomous community with the larger number of MPAs in Spain.

Interpretative incentives played an important role in raising awareness towards the need for protection of the marine environment, as well as encouraging other fishing communities to develop new proposals for MPAs.

6.3 Knowledge incentives

- Integration of local/traditional/indigenous knowledge in MPA decision-making

Scientists and fishers worked together in the design of the reserve and its functioning through different meetings and workshops. An infrastructure of geographical, environmental and fishery data was developed to be implemented in a Geographical Information System. They also worked together in the monitoring of the fishing activity by providing daily data from each vessel, continuous GPS tracks and complimentary data from landings.

- Promoting mutual respect and collective learning between different knowledge owners (*e.g.* scientists and local resource users)

One of the main strengths of this co-management project was the partnership capacity built between fishers and scientists. This partnership allowed integrating scientific information with the traditional ecological knowledge of fishers for the design of the marine reserve.

- Agreed basis for the role of precautionary approaches in the face of uncertainty

It was acknowledged that there are challenges regarding the level of scientific knowledge when it comes to predict the benefits of the marine reserve, especially the long term effecst in the food chain and that in that sense it

represents a pilot experiment.

The use of knowledge incentives has been essential to harmonise the design process and it also contributed to an enhanced compliance as fishers had a better understanding of regulations in which they could see their input.

6.4 Legal incentives

- Clarity and consistency in defining legal objectives of MPAs, jurisdictional boundaries, roles and responsibilities of different authorities and organizations

It is considered that the main driving forces causing an impact on the resources and biodiversity in the area of the marine reserve are being addressed appropriately with the changes in regulations brought by the current legislation.

- Effective judicial system for penalising transgressors

The management body will inform the Fishing Council of any breach of the regulations within the MPA which will give the appropriate sanction.

- Provision of financial and institutional resources from the state for MPA governance, particularly law enforcement

The surveillance of the area is done by Tragsa, a company in contract with the Autonomous Government of Galicia and coordinated by the management body of the MPA.

Legal incentives are important to control incoming users and to ensure a better enforcement of fishing regulations. However, they are not considered as important as economic, participative and knowledge incentives in promoting the effectiveness of the MPA.

6.5 Participative incentives

- Participative governance structures and processes such as stakeholder committees and consultations

The proposal of this MPA was developed in partnership between fishers, scientists, an NGO and members of the autonomous government through different meetings and workshops in a participatory process.

- Building trust/social capital between different actors

Mutual trust between scientists and fishers achieved through years of previous teamwork was essential to the success of the process.

Participative incentives were the most important to the success of the MPA. Being active part of the design and planning generated a sense of ownership in the fishing community which contributed to its effectiveness.

Cross-cutting issues

Leadership

Some stakeholders played a key role in the success of the MPA thanks to the long-term vision, consistency and stability of their leadership. This leadership had an important role in facilitating the use of incentives and bringing good MPA governance

Antonio Garcia-Allut, anthropologist of UDC is a local expert trusted by the fishing community through years of common work in different initiatives and has a good understanding of their needs and aspirations and how to address those through social engineering.

Emilio Louro, secretary of Lira's *cofradia* has also shown a strong commitment to promote sustainable fishing getting involved in numerous local and international initiatives.

Equity

An important fact in the success of the marine reserve is that it did not represent an imposition to the fishers, since the *cofradía* welcomed the idea from the beginning and participated actively in all the stages of the implementation. The inclusion of the fishers in the decision-making process and the use of their traditional ecological knowledge in the design of the reserve were crucial to promote a better understanding of its benefits and an improved compliance of the fishing regulations

Stewardship

A key factor in the effectiveness of the MPA is the sense of ownership generated by stakeholder participation, protectionism from incoming users, use of local knowledge and provision of property rights.

7. KEY ISSUES

A participatory approach in all the stages of the implementation process and the combination of scientific and traditional knowledge resulted in the promotion of mutual respect between stakeholders which was essential to achieve good MPA governance.

In the case of Os Miñarzos MRFI, social aspects have been paramount in the implementation process and every movement has been subject of careful planning and analysis. It was taken into account the idiosyncrasy and reluctance to changes of Galician fishing communities, and it was a great challenge to set the conditions to make the idea succeed. Another important issue is the terminology chosen in the proposal. The use of words with connotations of conservation was carefully avoided to prevent reactions of instant denial. Instead the words "fishing interest" were intentionally selected to make clear that such was the main objective. Also the clarity in establishing the objectives contributed positively to the effectiveness of the MPA.

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Isla Natividad Marine Protected Area
Governance Analysis

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Summary: This case is an example of the establishment of a community-based Marine Protected Area in which an environmental NGO played a key role. In general, the conservation and management impact of the MPA is still an open question because the MPA is still so new. However, lessons for appropriate balance in governance can still be drawn. The case draws attention to the incentives provided by exclusive resource access rights that are contingent on stewardship of the resources. Additional examples discussed include the role of resource users' prior experience with any informal voluntary conservation efforts; the extent of scientific and monitoring capacity of the governing institutions; and the use of step-wise, reversible, and shorter-term commitments to allow groups of stakeholders to move ahead with a plan despite persistent uncertainty, and to encourage compliance even when consensus about the MPA is lacking.

1. National Context

Population density: The Mexican state of Baja California Sur (BCS) is the least populous state in the country, with only ~ 500,000 residents. In addition, the case study zone, a coastal desert area in the central part of BCS, is one of the most geographically remote and "depopulated" areas of that state.

Mexico's government: multi-party democracy, with an increasing tendency toward neoliberal economic policy, especially favoring foreign investment in major industry (such as natural resource extraction and aquaculture) and privatization in the fishing sector of processing operations that were previously run through para-statal organizations.

Basic geographical parameters:

Isla Natividad is located in the Pacific Ocean at the northern limit of BCS, 6 km west of Punta Eugenia and 15 km south of Isla Cedros. On this tiny island, the cooperative members, non-member workers, and their families and a few workers who provide services in schools and other basic area make up the whole community of Isla Natividad.

The island, the fishing cooperative and community that created the MPA are located within the Vizcaino Biosphere Reserve. The MPA is essentially a six-year agreement to fully protect three of 42 fishing grounds off the coast of the island, equivalent to approximately 4% of the entire fishing territory.

The fishing territory is characterized by steep rocky cliffs and by rocky, kelp-dominated beaches. Upwelling and currents converge and contribute to the productivity of this area.
In addition, the main fisheries are benthic, and local abalone divers in the coop have developed expert knowledge about habitat through their diving experience. For the MPA, this means that there is a good existing local capacity for being able to detect effects of human actions on key resources and noticing change in the marine ecosystem in general.

2. Local context

The MPA was created by the cooperative within the waters of the cooperative's fishing concession encircling Isla Natividad. The 20-year renewable concession includes exclusive fishing rights abalone and other valuable benthic resources such as lobster, turban snail, sea cucumber and sea urchin. The concession expires in 2012; without the concessions the cooperatives would disappear, along with communities and families who have populated the zone for over 70 years.

Population per sq km: Isla Natividad is ~ 9sq km with > 500 people living grouped in a fishing village on one side of the island.

In the study area, being "marginal" in terms of population density and national and regional geography has implications for incentives and governance of the MPA in question, and the wider fishing activities carried out by the cooperative. (For example, the fact that the burden of enforcement has historically been borne mainly by cooperatives rather than authorities can be seen as an incentive for the cooperative to consider novel partnerships with NGOs, foundations and scientific organizations, as a way to seek external support for enforcement.)

Relative isolation of the study area in general also means that communities of the study zone sometimes fall "below the radar" of government, which has sometimes been desirable for the cooperatives but in general has been very costly and created certain hardship. Not only do cooperatives of the zone collectively invest enormous sums in enforcement of their fishing areas, in the communities certain basic services normally provided by government are still provided by local fishing coops, such as road maintenance. This is just now beginning to change, as the government has begun to view the study area, formerly only seen as a rather desolate place of resource extraction, as a landscape of value for tourism.

Population growth: is stable.

- Only people engaged in the cooperative's activities reside on Isla Natividad, and the cooperative currently has just over 90 members.
- There is an explicit "no growth" policy currently within the cooperative, as available fishery resources are understood as finite and now being used to maximum capacity.
- There remains significant social pressure to include new members whenever feasible because fishing is the best living available to many.

Per capita income:

- Per capita income of cooperative members is higher than the average for residents in the region, or what would be considered a middle class income for Mexico (e.g. for successful fishers, the equivalent of $40,000-$50,000 USD per year.)
- However, while fishing cooperative members on the whole live well, seasonal debt cycles make people vulnerable to economic ups and downs during crises times (for example, if a family member falls ill or earnings are not enough to cover the prior year's household debt plus current expenses).

Labor force by occupation: Fishing and all its associated activities administration, processing the product, shipping, enforcement, maintenance etc) is the economic activity that supports the community.

3. Why was the MPA designated?

A primary reason was the desire to rebuild lucrative abalone populations in fishing grounds surrounding the island. With guidance from an NGO, it was determined to try to rebuild stocks by protecting key areas for abalone larval settlement.

The Mexican environmental NGO that played a key role in the establishment of the MPA and continues to partner to monitor it is Comunidad y Biodiversidad (COBI). From the start COBI worked closely with the

fishing cooperative, *Buzos y Pescadores*, to help achieve a measure of consensus about the problem of rebuilding the stock and the notion of using an MPA as a tool. The cooperative requires collective decision making by members to implement fishery management measures, in total the MPA deliberations took several years before it was accepted for implementation.

COBI also saw scientific value in pursuing creation of an MPA at this site, with its relatively undisturbed ecosystem, to contribute to scientific understanding of the effects of MPAs in general. The reserve design includes an experimental and a control no-take area to allow for rigorous experimental testing of the effects of the MPA through annual monitoring. This design was driven by COBI but is of immediate interest to the cooperative as well; the coop and its sister fishing coops in the zone have experimented with no fishing areas informally over the course of the past 30+ years and are interested in systematic evaluations of their effectiveness to inform future efforts, whether formal or informal.

The involvement of government in the MPA has been seen as a way to reinforce and legitimize local efforts – the opposite of the more common "top-down" approach.

Many younger members of the cooperative were very supportive of the notion of using reserves as a management tool and a way to protect what they see as unique examples of relatively intact marine habitat of the region, but by no means are all members convinced yet. People abide by the rules for managing the reserve, despite this basic disagreement, because the cooperative has both the legitimacy and the power as an institution to insist on such compliance and to discipline those who do not comply. The authority and legitimacy of the local institution (the cooperative) rather than a centralized government underlies the MPA.

In addition to trying to increase the abundance of the most valuable commercially exploited marine resource in the area (abalone), many cooperative members agreed to implement the MPA because they saw other kinds of benefits, such as:

- a way to fortify claims to resource access rights in the long term by showing the government that the coop would go beyond the minimum requirements of stewardship (see below)
- A way to fortify efforts to defend the concession area against poaching by harnessing external resources and focusing government attention on the zone
- A way to limit the increasing legal presence of outsiders in the concession area waters, through designation of a formal Protected Area. (Outsiders may pass through the waters within the concession even though they may not fish the concessioned resources.)
    - "intrusion" by recreational diving or surfing expedition operators are seen as undesirable by coop members; they ultimately wish to capture additional income through conducting such recreational activities themselves
    - The presence of tourists not hosted by the coop is perceived internally to weaken the ability to discourage piracy through controlled access to the area.

In this case it is also important to distinguish between the reasons for wanting to implement an MPA, and the elements that helped make it possible to implement an MPA. Examples of the latter include:

a) Trust formed over time between the coop and COBI, the NGO mentioned previously, that subsequently facilitated implementation of the MPA and other partnerships for funding (from the Walton Foundation) and monitoring (i.e. with REEFCHECK in California.
b) The internal capacity in the coop for scientific monitoring, science-based decision making, and conservation advocacy; this is a significant achievement considering that most members have only secondary school education, and conservation ideals are constantly weighed against shorter term economic needs and desires. The MPA blends scientific monitoring approaches of outside groups and the experience-based environmental knowledge of participants from the cooperatives.
c) The history of experimentation with informal marine reserves at the site; the concept of an MPA was considered in terms of that existing mental model
d) The ecosystem was already in good condition

e) The cooperative was already in a healthy economic condition, so that the MPA could appear to many as a relatively low-risk venture
f) The cooperative began the MPA as a short term experiment (a six year effort to be evaluated for its effectiveness and voted on in 2011 to determine whether it should be continued for another 6 years) which facilitated agreement to move ahead
g) The cooperative had previous experience with "greening" its operations and considering ecosystem level issues through successful certification of its lobster fishery by the Marine Stewardship Council.
h) There was an existing history of a stewardship practice that developed through the experience of co-management of fisheries with the government and the need to meet obligations of 20-year exclusive concessions

4. Legal basis

Concessions contingent on stewardship performance: Fishing concession renewal is contingent on stewardship of resources through cooperation in co-management and monitoring with government, enforcement to discourage poaching, and proactive efforts to rebuild abalone stocks. Thus far the latter has mainly included activities such as laboratory cultivation of abalone larvae and reseeding; this continues at notable expense to the cooperatives, although its effectiveness to date is unclear. In short, the 20-year exclusive concession provides legal basis for the cooperative to count on reaping the rewards of present sacrifices, and the MPA (if it works!) can be a new tool to help comply with the legal mandates of the concession.

Cooperative law: More broadly, cooperative law in Mexico governs how coops should operate, and sets guidelines for basic elements such as democratic decision making and parameters for distribution of the coop's income. Mexican cooperative structure and ideals draw on the European Rochedale model.

The nature of collective decision making in the cooperatives of the study zone, particularly their ways of dealing with uncertainty when many alternative courses of action are available, and their ways of dealing with disagreement among members of the collectivity during decision making processes, draw on the history of cooperative spirit that has remained strong in this area.

5. Legal Management Objectives of the MPA

Maintaining ecological, economic and cultural vigor are all priorities to those who implement the reserve, as well as proactively helping rebuild abalone stocks fished by the cooperative, and learning something about the effectiveness of MPAs in the process. The best fits for the case seem to be categories IV and VI:

CATEGORY IV Habitat/Species Management Area: protected area managed mainly for conservation through management intervention

Definition Area of land and/or sea subject to active intervention for management purposes so as to ensure the maintenance of habitats and/or to meet the requirements of specific species.

CATEGORY VI Managed Resource Protected Area: protected area managed mainly for the sustainable use of natural ecosystems

Definition Area containing predominantly unmodified natural systems, managed to ensure long term protection and maintenance of biological diversity, while providing at the same time a sustainable flow of natural products and services to meet community needs.

It is noteworthy that conservation objectives of the MPA stem generally from the cooperative's obligations as stewards of the resources of the concession, but their voluntary use of reserves goes above and beyond any specific stipulations in the concession legal documents. (More recently, COBI has worked with cooperatives who do not have the same security of marine tenure as this case study, as in Bahia Magdalena to the south, and COBI is helping to build capacity of cooperatives who are interested in using MPAs as a tool for responsible fishery management.)

6. Operational management objectives

Key elements are:

Scientific monitoring since 2006 by the cooperative members themselves with partners including scientists from COBI, the US based NGO called REEFCHECK, and individual experts (including F. Micheli of Stanford University, a partner in the NSF-funded "Biocomeplexity" research on small scale fisheries from which this case study is drawn.)

Enforcement of the MPA including support (for equipment and other human and capital inputs) from the Walton Foundation.

Vision: The MPA objectives are closely related to an over-arching long-term vision for the cooperative and the region: to maintain a prosperous fishing way of life for the descendents of the cooperative members and their families.

7. Effectiveness in addressing the main pressures

It is still too early to draw firm conclusions about the conservation impacts of the reserve, although participants report that preliminary observations are promising.

Notes on economic incentives and how they might change looking forward:
While the price of abalone has remained extremely high (worth as much as $80 per 8 ounce can in Asian markets), recent economic jolts may be changing the picture, and could change the configuration of incentives in this case in the future. Anecdotal indications include that during the last season, at least one cooperative in the study area had trouble selling the abalone harvest in advance for the first time since processors were privatized.

Regarding climate change, the design of the reserve was not meant to address such questions or concerns, although it is indeed a concern in the area. The main food of abalone is the kelp macrosystis which is very sensitive to changes in sea temperature, and which suffers during the el nino events which may become more frequent and severe. The Isla Natividad cooperative was hit very hard by such climatic events in the 1990s and according to key informants in leadership is only recently begun to emerge from the effects of the financial crisis that followed failure of the abalone harvest.

Regarding tourism as an economic alternative to fishing in the zone: This cooperative's efforts at organizing to take charge of tourism in the concession have been rather fragmented, in part due to usual difficulties of achieving consensus for a new initiative, and a general split in the opinions along generational lines. The longer action is delayed, the more likely the cooperative will have to compete with private interests.

Enforcement seems to be very effective, with the cooperative receiving support to offset some of the costs of activities (upwards of USD $100,000 per year on full-time surveillance to deter poaching inside and outside the reserve areas) and enhance its capacity in terms of technology and personnel.

8. How have incentives been used to address the conflicts?

Many economic incentives predate the creation of the MPA but clearly support it. It is helpful to distinguish between the incentives inherent in the cooperative institution versus the MPA institution. Incentives predating the MPA, which represent enormous investment on the part of the coop, include upholding obligations of the concession mentioned above; the practice of reinvesting the cooperative's income in the community

infrastructure, etc.

8.1 economic incentives

Reaping future economic benefits as a direct result of increased fishery performance (especially of abalone stock) was a main premise for creating the MPA.

The cooperative's prior experience with MSC lobster certification has pushed the direct economic incentives of "green marketing" to the background. New lobster markets turned out not to be a net gain for the coop, but the political benefits of certification have paid off in other ways. On occasion such political leverage is converted into material and other kinds of benefits to the study zone (i.e. government paving of a road). This logic of building social capital also seems to have been at work in the MPA case.

Some coop members believe that the MPA will be an effective marketing tool that distinguishes the coop as ecologically friendly operation in negotiations with potential buyers, and present the MPA and [presumed] conservation benefits as a kind of added value.

Marine reserves represent a monetary investment by cooperatives, and an opportunity cost. Many NGOs are keen to promote alternative markets such as tourism to compensate for part of the opportunity cost of not fishing (a cost which theoretically will increase over time if organisms inside reserves grow in number and size.) But interestingly, the logic of many cooperative members however does not always resemble that sort of cost-benefit calculation. Not fishing in an area for a time is often understood by coop members and leaders as a kind of savings account in which, as long as enforcement is effective, provides a measure of security and simply increases in value the longer you wait to harvest it.

In Isla Natividad, virtually everyone theoretically stands to benefit from the reserve if it works to increase abalone populations (assuming of course that economic benefits of that are distributed according to legal requirements). That is not necessarily be the case for a sister coop in the neighboring concession on the mainland of the peninsula, where the community is larger and includes members who do not receive direct benefits from the cooperative's relative wealth, and where wealth is not distributed as evenly throughout the community. This very high degree of uniformity of interests on the island may be an important reason why the reserve can be implemented effectively and given a chance to work.

8.2 interpretative incentives

Many younger members and leaders in the coop feel that the MPA is a public expression of the coop's forward-thinking position in the cooperative movement and as a business, and the MPA has thus increased their pride and commitment to the organization.

In addition, recent NGO partnerships have reinforced a growing interest among some younger members to the value of conserving ecological uniqueness and beauty for its own sake.

Although not all members are convinced of the value of the MPA as opposed to other alternatives, debating the issue of MPAs within the coop has brought concepts like "ecosystem" conservation and "sustainability" to the fore of the discussion. Former generations of members talked only in terms of production. This change is occurring despite some resistance by older members, some of whom believe it is a waste of time to try to influence tomorrow's fishing outcomes by not fishing today.

8.3 knowledge incentives

As indicated previously, capacity for scientific monitoring is another area where this cooperative had a significant head start.

History of and interest in experimenting. The study cooperatives had used temporary closed areas (ranging from 1-5 fishing seasons - check) in the past as a means to try to restore populations of abalone. These decisions to forbid harvesting in an area are referred to using the same verb (*vedar*) as is used to indicate closed fisheries seasons mandated by government. Simultaneous with this MPA experiment, other cooperatives in region are actively prohibiting abalone harvesting on 1 or more banks with the intention of allowing the banks to "rest" from harvesting pressure. In all cases of such closures, the sites are chosen because they are known by divers to have had high abalone abundance during the course of their careers – that is, they have reason to believe that these areas will recover and be abundant again given the opportunity. This may seem obvious, but it stands in contrast to some cases where sites are selected through analysis by outsiders (sometimes based on computer models) and may not correspond to local understandings of "important" sites, and thus may appear illogical at best. At Isla Natividad specifically, key informants described the use of "closed areas" before and that they were seen to work was one of the basic reasons they were able to convince all the members of the coop to go along with the idea of collaborating with COBI on a more formal protected area.

Some characteristics of "informal" coop-mandated closures at the study sites have included:

- no fishing for abalone only (doesn't apply to lobster or other species
- access in general to the closed area is not restricted any more than the rest of the concession (only abalone harvesting is forbidden)
- closed area always placed in specific banks where abalone was notably abundant previously
- closed areas are generally considered to work by the fishers in the coops; when they fail to work, it is attributed to illegal fishing
- enforcement is seen as the biggest drawback and risk in creating closed areas; outsiders learn where the area is and benefit from the concentration of recovering abalone populations
- monitoring is often ad hoc rather than systematic.

8.4 legal incentives

Biosphere Reserve management regulations: The MPA was seen by cooperative leaders as another layer of protection that could be provided by special conservation status. The cooperative of Isla Natividad is considered to be in a core area of the reserve and has more restrictions on it than the sister cooperatives (and certain extra expenses as a result, such as for waste management). In general the cooperative has sought to use the presence of the reserve to leverage its claims to excluding outsiders to the zone, and has been an effective partner to reserve managers.

Criminal laws: As explained above, coops are required by the exclusive concessions to take main responsibility for enforcing their marine boundaries (and have great interest and capacity for doing so), in coordination with government; but only agents of the government can legally use arms and/or prosecute transgressors of the law, and the will and resources to do this is lacking. Delays, inefficiency and corruption are a few of the complaints made by cooperative leaders when navigating the legal tangle to prosecute poachers. Their frustration culminated in a dramatic demonstration of protest in 2007 when the cooperative, along with its sister federated cooperatives in the zone, staged the burning of a skiff that authorities had confiscated from poachers and left languishing on the beach, a symbol of the government's poor performance.

Fisheries management laws: As these laws are increasingly revised and updated (and keep pace with neoliberal economic policy changes) the cooperatives have participated and exerted power where possible to ensure that the "public" sector to which fishing cooperatives belong can retain some advantages despite increasing privatization in fishing.

General marine resource access rights:
There are some overlapping and contradictory rights to marine resources in Mexico, and it is important to emphasize that these rights are being contested by people outside of the cooperative system, even some people

living in the community who want a “piece of the pie”. For example the Mexican constitution indicates that anyone may use resources for subsistence, but from the perspective of the cooperatives this is the kind of loophole through which poaching occurs. Indeed, an MPA may be an effective way for the cooperatives to ensure that even “subsistence” use of resources like abalone are further limited.

8.5 participative incentives

The Buzos y Pescadores cooperative and others in the study zone have overcome many of the basic and rampant problems cooperatives face (ranging from corruption to lack of expertise in administration) and have become national and international “models” of cooperative organization.

As indicated in many of the previous responses, the general legitimacy of the cooperative and, and practices aimed at fairness, transparency, democratic decision making and balances of power that are part of the coop’s workings, all relate to the key role of participation. This underpins the implementation of the MPA, and makes nearly all the items listed in this section of the “menu” applicable, as illustrated in examples already mentioned throughout.

The implementation of the MPA is participative as well, which buttresses its legitimacy as well. Local divers received scuba training and gear donated by COBI; workshops were used to pool local and scientific knowledge in choosing the control and experimental sites, and discussing reserve strategies; a lead biologist who is a member of the cooperative and acts as liason and helps bridge the as needed between scientists and other interested parties.

In addition, representatives from COBI and other external participating organizations are “accountable” to the cooperatives, reporting in person at twice yearly assemblies of all coop members, and/or in writing.

9. Other incentives relevant to case study

Aside from the cooperative spirit referred to earlier, a locally meaningful concept in this case is “*patrimonio*” (patrimony). This is a way of valuing the marine environment at the site that is both economic and cultural. One’s patrimony is what sustains the household and also the legacy one will one day leave to one’s children. One leaves behind the right to access a viable livelihood (rather than accumulated wealth from a resource). This understanding of patrimony might be seen as the cultural explanation for the stewardship behavior that has been discussed here up until this point in more economic and legal terms.

10. Estimate of relative application of incentives in the case

Economic	35
Interpretive	15
Knowledge	30
Legal	5
Participative	15

11. Imagining scenario to improve MPA governance at the site through application of the incentives in different proportions:

This is a challenge to estimate because conclusions haven’t yet been drawn about the effectiveness of the MPA. However, because this is an example of already highly participative governance, a key for future efforts may be to focus more on knowledge elements in order to address uncertainties.

Great South Bay Marine Conservation Area
Governance Analysis

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1. CONTEXT

Basic geographical parameters

Size of MPA (km^2): 54 km^2
Coastline length (km): approximately 10.7 km
Distance from shore: The Great South Bay Marine Conservation Area abuts the coastline in some areas and is within approximately 125 meters of the shore in other areas. The preserve lies in a semi- enclosed embayment, between barrier islands and the main island of Long Island, within New York State territorial waters.

Population per sq km:

- U.S.: 31.26 people/sq km[26]
- Long Island: 2,110 people/sq km[27]

Population growth rate:

- U.S.: 0.975%[28]
- Long Island: 4%[29]

Per capita GDP (PPP US$):

- U.S.: $48,000[30]
- New York City, Northern New Jersey, Long Island: $53,706[31]

GDP annual growth rate:

- U.S.: 1.3%[32]
- Long Island: .08%[33]

GDP Composition by Sector:

- U.S.: agriculture: 1.2%; industry: 19.6%; services: 79.2%[34]
- Long Island: industry: 70%[35]

Labour force by occupation:

- U.S.: managerial, professional, and technical 35.5%; sales and office 24.8%; manufacturing, extraction, transportation, and crafts 22.6%; other services 16.5%; farming, forestry, and fishing 0.6%[36]
- New York City, Northern New Jersey, Long Island: trade, transportation, and utilities 18.7%; educational and health 17.1%; professional and business 15.4%; government 15.2%; financial services 9.1%; leisure and hospitality 7.8%; manufacturing 5%; other services 4.4%; mining, logging, and construction 4.2%; information 3.3%[37]

Unemployment rate:

- U.S.: 7.2%[38]
- New York City, Northern New Jersey, and Long Island: 7.6%[39]

Government Type:

- U.S.: Constitution-based federal republic; strong democratic tradition[40]

The extensive resources of the Great South Bay shaped the rich maritime heritage of many south shore communities and the bay was renowned for its shellfisheries both nationally and internationally during much of the 1900s. Up into the mid to late-1900s, the oyster and hard clam populations within the Great South Bay, including the Bluepoints Property, supported a thriving shellfishing industry. In the mid-1970s more than half of the hard clams eaten in the entire United States came from the Great South Bay. When clams were abundant, they also filtered 40% of the water in the Great South Bay daily. But natural and manmade problems caused a great decline in shellfish populations, and by 2003 there were only enough hard clams to filter about 1% of this vast body of water daily. The Great South Bay ecosystem became a shadow of its former self.[41] [42] [43]

[26] https://www.cia.gov/library/publications/the-world-factbook/geos/US.html
[27] http://en.wikipedia.org/wiki/Long_Island
[28] https://www.cia.gov/library/publications/the-world-factbook/geos/US.html
[29] http://www.longislandindex.org/changing_population0.html
[30] https://www.cia.gov/library/publications/the-world-factbook/geos/US.html
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[39] http://www.bls.gov/web/laummtrk.htm
[40] https://www.cia.gov/library/publications/the-world-factbook/geos/US.html
[41] http://www.estuary.cog.ny.us/council-priorities/living-resources/bluepoints-bottomlands-project.pdf
[42] http://www.nature.org/wherewework/northamerica/states/newyork/science/art21714.html
[43] http://www.mcatoolkit.org/pdf/Publications_and_Presentations/Pub_Law_Policy_Booklet_Ch_4_NY.pdf

Perhaps in contrast to the majority of MPAs, The Nature Conservancy's Great South Bay Marine Conservation Area was not initially designated by any of the public natural resource management agencies – or the surrounding communities. Rather, a colonial patent granted a large submerged land parcel into private ownership in 1693. Rights of the private, fee-simple ownership are inclusive of the rights to regulate activities (other than navigation and riparian rights of adjacent upland property owners). Following the sale of the property by the heirs of the original colonial owner, the property was used for large-scale harvest and aquaculture of oysters and clams from the early 1900s through 2003. Changes in the natural productivity of bivalves in the bay eventually forced the sale of the property, which through two separate acquisitions totaling over 54 sq. km became the property of The Long Island Chapter of The Nature Conservancy. TNC acquired permanent, fee-simple property rights to the site with the hopes that a multi-use management plan at the site could be implemented to restore and protect the health of the entire estuary. Recognizing the need to enlist the support of many levels of government and stakeholders The Nature Conservancy created an advisory board (the Bluepoints Bottomlands Council) consisting of all of the relevant natural resources managers, stakeholders and scientists. With their assistance, plans were developed to use the property as a platform for system-wide restoration of molluskin shellfish, and as a place to implement ecosystem-based management approaches designed to improve and sustain the integrity of the natural system. The Nature Conservancy's ownership rights and policies prevent several natural resource extraction activities, particularly shellfishing, and the use of bottom tending commercial fishing gear such as traps and dredges. Resource managers are backing up some of these policies with additional codes and regulations, such as the 2009 decision by Brookhaven Township to designate the entirety of The Nature Conservancy's owned lands as a Shellfish Management Area. Within the newly designated management area, all shellfishing is prohibited as one of several strategies being employed to bring back a decimated hard clam (*Mercenaria mercenaria*) population, which supplied over half the clams eaten in the US in the 1970s. Justifications to restore shellfish include the provision of their ecosystem services as well as developing a naturally sustainable fishery. [44] [45]

2. OBJECTIVES

2.1 Legal basis under which the property rights are established [46]

In 1694 William Smith, First Lord of the Manor of St. George bought the Great South Bay underwater lands, located between the Carmens River and the Connetquot River, from Chief Tobaccus for 10 pounds. In 1900, after a long history of dispute with the Town of Brookhaven, which also claimed ownership of some of these lands, a court appointed commissioner divided the property. The Smith family received the western portion (13,397 acres) and the Town of Brookhaven received 17,947 acres to the east. The property changed hands several times and in 1968 the First Republic Corporation of America acquired the underwater lands as well as the Bluepoints Oyster Company. In 2002 the majority of the Smith family's underwater land holdings from 1900 were donated to The Nature Conservancy. One large piece (1,500 acres) was retained by First Republic until October 2004 when The Nature Conservancy purchased it.

Court decisions and resulting principles lead to the conclusion that, based on the express, exclusive rights established through the original grants, patents and deeds from which the Bluepoints Property (now The Nature Conservancy's Great South Bay Marine Conservation Area) is descended, the ratification of such rights through Colonial Law and the New York State Constitution, and a series of decisions from New York's highest court regarding the scope of these rights, the Conservancy's property rights in the area are quite clearly defined and are quite comprehensive. Other than the public right of navigation across the waters of the area, there are no public rights that can be asserted within the area's perimeters. Nothing affecting the bottomlands of the property, or hunting, fishing (including shellfishing), or fowling within the perimeter of the property, can occur without the Conservancy's express approval and consent. However The Nature Conservancy has at this point chosen only to limit the few activities that appear to be in conflict with its goals. In many ways, certain uses, even extractive uses such as recreational fishing and waterfowl hunting help to build a constituency for The Nature Conservancy's long-term ecosystem restoration and conservation objectives.

[44] http://www.mcatoolkit.org/pdf/Publications_and_Presentations/Pub_Law_Policy_Booklet_Ch_4_NY.pdf
[45] http://www.estuary.cog.ny.us/council-priorities/living-resources/bluepoints-bottomlands-project.pdf
[46] http://www.estuary.cog.ny.us/council-priorities/living-resources/bluepoints-bottomlands-project.pdf

2.2. Legal & operational management objectives

The Great South Bay Marine Conservation Area is an example of a strategically located, formally degraded habitat site which the Conservancy acquired, is restoring and protecting from future impacts. The Conservancy's primary management objectives include using ownership of this site as a means to restore and protect the native shellfish and seagrass habitats on the site as well as throughout the entire estuary. Goals also include leveraging our role as a primary stakeholder to move the development and implementation of projects and policies within the Great South Bay, its watershed, and along the barrier islands that will help to restore and protect the natural integrity of the site for future generations. Lastly, program staff believe that extensive monitoring of progress, particularly with shellfish restoration and management can serve as a model which can be adapted for use in other similar estuaries.

While The Nature Conservancy's Great South Bay Marine Conservation Area has yet to be formally recognized as a marine protected area by the IUCN, the entire 54 km^2 site is best characterized as a Category IV Protected Area – A Habitat/Species Management Area as it protects particular species (molluskin shellfish) and habitats (seagrass beds) and the management and restoration activities reflect these priorities. The conservation area requires regular, active intervention by The Nature Conservancy and its partners to address the requirements of the shellfish and seagrass communities.

As the preserve is privately-owned, there are no legally mandated biodiversity conservation objectives associated with the site. The Conservancy works on its own volition in collaboration with public and private partners at local, national, regional and international levels to protect biodiversity. It is worth noting that many of The Nature Conservancy's objectives are for the entire estuary – thus although certain actions can be taken on TNC property unilaterally, restoration and protection of the entire system can only be accomplished through a coordinated partnership with elected officials, management agencies, and stakeholders.

While the objectives below apply to the Great South Bay Marine Conservation Area, they are drawn from the Conservancy's conservation plan for the entire Great South Bay watershed.

Objective 01: Re-establish the hard clam population in GSB to an average density of 6 clams per meter squared by 2020 for the purposes of ecosystem health/enhancement and sustainable harvest.

Objective 02: Maintain existing salt marsh acreage from a baseline constructed from the most recent available height-of-growing-season imagery, increase acreage where possible, and enhance functionality of Great South Bay salt marsh by 2015.

Objective 03: Maintain 2002 seagrass acreage (14,000 acres) in Great South Bay and increase acreage by 10% over 2002 levels by 2015.

Objective 04: By 2015, ensure that natural movement of the barrier island (which is necessary for the long-term integrity of the island in light of rising sea-levels) can potentially occur without human intervention.

Objective 05: By 2012 develop a vision and coordinated plan to achieve sustainable predator and prey finfish species abundance levels designed to meet pre-determined human use and ecosystem objectives.

Objective 06: Rebuild the Mid-Atlantic Southern New England winter flounder stock as specified in Amendment 1 to the ASMFC Winter Flounder FMP, expand knowledge of the species, and reduce human use impacts on flounder reproduction in Great South Bay.

Objective 07: Increase the size of the Great South Bay alewife population from less than 10,000 individuals to greater than 100,000, distributed over at least four tributaries by 2022.

Objective 08: By 2015, increase the number and productivity of piping plovers to 65 pairs and a five-year

average of 2.0 chicks fledged per pair for the Fire Island reach of their New York range.

Objective 09: Maintain a sustainable nesting population of horseshoe crabs in Great South Bay at a level that also provides adequate forage for fish and shorebirds.

Objective 10: Reduce pollution in Great South Bay to ensure that water quality is sufficient to support the viability and sustainability of the habitats, species and human uses of GSB by 2015.

Objective 11: By 2020, reduce New York State greenhouse gas emissions to 10% below 1990 levels, and establish a well-coordinated, multi-layered approach to protecting coastal habitat in the face of sea level rise.

Objective 12: By 2015 increase the environmental stewardship ethic on Long Island as measured by a 25% increase in the acceptance and actions for implementing an ecosystem-based approach to planning and management on land and in the water.

3. DRIVERS/CONFLICTS

The waters of the Great South Bay Marine Conservation Area primarily support:

- Transient navigation/boating – including public and private, commercial and recreational. The Nature Conservancy does not have the authority to limit navigation. Threats caused by boat traffic (scaring of seagrass meadows though running aground of vessels) are generally unintentional. This threat is most pervasive outside the areas owned by The Nature Conservancy, thus the Conservancy is working with state, federal, and local managers to try to address this issue through the development of a seagrass management plan and boater education programs.
- Recreational finfishing is allowed on TNC property. Recreational fish are largely migratory and it is most appropriate to manage this activity regionally. Entities such as Atlantic States Marine Fishery Committee are already focused on this.
- The use of traps, dredges and anchored gill nets are not allowed; nor is shellfishing of any kind. These activities did not appear consistent with our conservation objectives as they posed threats to several conservation targets. However, there is the potential for some future limiting trapping of whelk at some restoration sites, should studies suggest that this would help facilitate our restoration objectives.
- Recreational waterfowl hunting is similar to recreational fishing in that the species sought are migratory and are best managed regionally. At this time waterfowl hunt does not appear to pose a threat to our conservation targets.

The primary drivers behind the degradation of shellfish, prior to the Conservancy acquiring the site included:

- Commercial shellfish extraction – which completely depleted the shellfish resource and became non-commercially viable to continue operations. The Conservancy's acquisition of the property eliminated the last large mechanical shellfish extraction activities in Great South Bay. Non-mechanical shellfish extraction still occurs outside the area owned by TNC, however TNC is working with managers and stakeholders to assure that these activities are done in a way that is consistent with bay-wide shellfish rebuilding goals and long-term sustainability goals.
- Changes in plankton species assemblages, and harmful algal blooms such as Brown Tide – which are contributed to by changes in nutrient loading rates (particularly land derived), changes in nutrient cycling (particularly due to the decline in suspension feeding shellfish abundance), rates of oceanic flushing (due to barrier island stabilization and inlet management). These threats need to be addressed at a scale larger than the ownership of TNC's particular piece, thus we are working with partners on long-term solutions that we hope will benefit the entire estuary

Other threats that impact the preserve's biodiversity, originating from both outside (+) and inside (-) the preserve, include:

- Algal blooms (+) (-)
- Boat traffic (recreational and commercial) (+) (-)
- Breach contingency/inlet management (+)
- Climate change and severe weather (temperature extremes, sea level rise, habitat shifting and alteration) (+)
- Dams (reduction in freshwater input) (+)
- Destructive harvest methods (-)
- Deteriorated shellfish beds (-)
- Deteriorated seagrass beds (-)
- Deteriorating marshes (-)
- Development (+)
- Direct human caused mortality (harvest of mussels, forage fish, fishing by-catch, discard mortality) (-)
- Disease (+) (-)
- Dredged spoil deposition and beach nourishment (+) (-)
- Dredging for navigation (-)
- Excessive herbivory (-)
- Excessive macroalgae (+) (-)
- Inadequate culverts (+)
- Incompatible recreation (human intrusions and disturbance) (-)
- Invasive species (Phragmites) (+)
- Power plant entrainment and impingement (+)
- Predation (Cormorant, fish. crabs, whelks, cats, gulls, etc.) (-) (+)
- Restricted sediment transport (+) (-)
- Shoreline armouring (+) (-)
- Tidal restrictions (+) (-)
- Water quality degradation/pollution/toxic contaminants (imbalanced concentration and composition of nutrients from household sewage & urban waste water; stormwater runoff; fertilizer application; low dissolved oxygen; Reduced pH of sediment pore water) (+) (-)
- Sand mining (+)

4. GOVERNANCE FRAMEWORK/APPROACH

The Great South Bay Marine Conservation Area is a spatially defined geographical area, with agreed upon and demarcated borders. The area is recognized and protected through private, fee-simple ownership by The Nature Conservancy. Although on paper, private ownership should be enough to prevent unwanted activities, The Nature Conservancy continues to work with various levels of government to have them recognize the value of certain protections and encourage them to create redundant codes, laws and regulations to simplify enforcement, and allow for active agency enforcement.

Since the Great South Bay Marine Conservation Area was formerly owned by a private commercial shellfish company that demarcated the site's boundaries, actively patrolled the area, and prohibited all recreational and commercial shellfishing on the site, local community members recognize the private ownership of these underwater lands and appreciate that many public activities are restricted on the site. The previous owners of this property had their own private surveillance and security team on the site, however The Nature Conservancy did adopt this approach; rather it relies upon local enforcement agencies to enforce the area. A key governance issue is that relationships between The Nature Conservancy, stakeholders, and the various levels of federal, state, county, and town enforcement agencies are not simple, straight forward, or 100% effective. Local enforcement agencies often do not regard the enforcement of the area as a high priority, and fully exercising the Conservancy's rights as property owners may generate tensions between the Conservancy and government agencies. Although a legal assessment of the Conservancy's property rights suggests that the Conservancy can legally regulate all activities other than riparian access and public navigation, attempts to regulate activities that had not at all been regulated by the past owners (such as sport fishing which is regulated by the State) would likely erode public support for existing conservation efforts and jeopardize relationships

with government agencies.

Current enforcement of the Conservancy's property rights, state laws and local ordinances, as a means to reduce continuing threats to biodiversity within the Great South Bay Marine Conservation Area is accomplished by several means, including:

1. Establishment and maintenance of good, local community relations;
2. Outreach and education about the area and restrictions within the local community;
3. On-site presence of Conservancy staff and partners as a visual deterrent;
4. One-on-one contacts with the public in and adjacent to the area by staff and partners
5. Participation in local community events by staff;
6. Collaboration with local law enforcement, summoning assistance when violators are encountered and police action is required;
7. Establishment and enforcement of a local ordinance designating the preserve as a no-take Shellfish Management Area;
8. Establishment and participation on the Bluepoints Bottomlands Council, which is an organized group of public and private individuals who represent local, state and federal interests and are working together to create a long-term vision for Great South Bay (which includes large areas outside of the Conservancy's property as well as the property itself);
9. Development and implementation of a collaborative, county-wide coastal resilience project; and
10. Development of municipal partnerships to revise shellfish harvest management codes to assure they are consistent with achieving rebuilding and sustainability objectives.

5. EFFECTIVENESS

In combination, the above efforts have generally been effective in:

- Continuing the prohibition of commercial and recreational shellfishing in the preserve;
- Prohibiting the use of restricted fishing methods (dredges, etc); and
- Prohibiting public or private structures (such as docks and bulkheads) from being built on Conservancy owned lands.

Minor infractions to the shellfishing prohibitions occur occasionally within the area. While this has not been a major issue, the attractiveness of the area to shellfish interests is likely to increase as our shellfish restoration efforts continue and shellfish beds within the area continue to grow. However, the recent establishment of the area by the Town of Brookhaven through an ordinance that makes the site a no-take shellfish management area is expected to help deter future violations related to shellfishing. The ordinance allows local law enforcement to take action without the Conservancy's direct complaint as the underlying landowner whose private property rights are being infringed upon. It is too soon to tell how effective this will be.

It has been more difficult to address threats that originate from outside the preserve. While these threats cannot be addressed as directly as the other threats by the Conservancy, we have started and continue to seek improvement and resolution to these external issues through participation on the Bluepoints Bottomland Council, South Shore Estuary Reserve Council, The New York State Ocean and Great Lakes Ecosystem Conservation Council and coastal resilience planning effort. Ultimately, it will be these larger collaborative community planning processes that lead to the restoration and sustainable management and conservation of Great South Bay, both inside and outside of our marine conservation area. Because of the Conservancy's ownership of nearly a quarter of the bay, however, we are uniquely positioned to actively engage in and provide guidance to the planning processes. These processes should continue to facilitate our attempts at addressing:

- Watershed sources of pollution;
- Unsustainable development;

- Adaptation to sea level changes and coastal storms; and
- Barrier island management.

Effective scale: 2 (Some impacts partly addressed but some impacts not yet addressed)

6. INCENTIVES

The main incentives that have been used to ameliorate or attempt to ameliorate the conflicts between resource exploitation and biodiversity conservation include:

- Education, in regards to ecosystem services provided by shellfish;
- Improvements in abundance of shellfish in harvest areas, via spillover effects from spawner sanctuaries;
- Engagement, via establishment of the Bluepoints Bottomlands Council;
- Financial Investment -- since The Nature Conservancy's acquisition of the submerged lands, millions of dollars in private/public partnerships have been spent in the estuary that would not have happened without our involvement; and
- Momentum – the Conservancy works hard to keep projects moving and progress reported.

6.1 Economic incentives

- Promoting economically and ecologically sustainable resource exploitation

Over the past five years of ownership and management of the Great South Bay Marine Conservation Area, the Conservancy has planted over 3.4 million adult clams on a network of sanctuaries within the preserve, totalling approximately 60 acres. Each female clam produces 1.6 to 6.3 million eggs per year. These adult shellfish have been reproducing -- in 20`08 approximately 320 million one-year old clams were detected within the vicinity of the stocked adults. These juvenile clams occurred at densities exceeding five clams per square meter on approximately 5,000 acres of The Nature Conservancy property as well as the adjacent town property to the east (larval drift tends to be towards the east in this part of the bay due to prevailing southwest winds in summer). This represents more than a 4,000% increase in juvenile clam abundance on TNC property from 2006 – 2008.

Conservation of estuarine habitats within the Great South Bay Marine Conservation Area provide important critical ecosystem provisioning and supporting services such as water filtration and spillover effects for recreational and commercial shellfish harvesting, which are important social and cultural traditions of the surrounding communities.

- Protection from incoming users

Shellfishing near the area is allowed only by local residents.

- Allocation or reinforcement of community/user property rights

We are returning to a more public stewardship model for a piece of property that has been privately owned for 300 years. In the last several decades the area was mismanaged by its corporate owner, which eventually liquidated it and the living assets within it. This example shows that the private, for-profit ownership model does not necessarily assure a conservation outcome since, in this case, there was a sound corporate incentive to seek short-term economic gain over long-term sustainability.

It is important to remember an NGO owns, in fee-simple, the entire marine conservation area. We are spending money to restore it – there is the incentive that one day this can once again become public property after 300 years of private, for-profit ownership.

- Funding from private or NGO sources to promote the effectiveness of the MPA through the use of various incentives, provided that this funding does not lead to 'institutional capture' - undue influence on MPA governance that undermines the effectiveness of the MPA.

Since The Nature Conservancy's acquisition of the submerged lands, millions of dollars in private/public partnerships have been spent in the estuary. In its first year the project was all supported by private moneys (foundation and individuals) since that time there has been much public interest and the funding stream has been about 60% public funds (County, federal, state, even town). Much of the private support is derived locally from individuals and foundations based in this local geography.

6.2 Interpretative incentives

- Public communication, education and awareness raising on the importance/vulnerability of marine ecosystems and the benefits of the MPA through newsletters, web sites, education programmes, media campaigns, etc

Outreach and education activities about the area and restrictions have been conducted within the local community.

- Promoting recognition of the potential benefits from well-managed MPAs, *e.g.* spillover to surrounding fisheries, enhanced resilience, ecosystem services.

Education programmes promoting the recognition of ecosystem services provided by shellfishes are key governance incentives applied in the MPA.

6.3 Knowledge incentives

- Integration of local/traditional/indigenous knowledge in MPA decision-making

This is based on the concept that informed public and informed managers will make better decisions. Recent understanding has led The Conservancy and public to collectively agree that we want to manage the bay in a way where shellfish are much more abundant and where seagrasses can grow.

- Maximising scientific knowledge to guide/inform MPA decision-making

Applied research and monitoring provide information and guidance on actions to make the above management objectives possible.

6.4 Legal incentives

- International-regional-national-local regulatory obligations that require effective MPA conservation

As the preserve is privately-owned, there are no legally mandated biodiversity conservation objectives. However, the recent establishment of the area by the local town through an ordinance that makes the site a no-take shellfish management area allows local law enforcement to take action without the Conservancy's direct complaint as the underlying landowner whose private property rights are being infringed upon.

- Establishing public-private partnerships in law enforcement

TNC has established collaborations with local law enforcement units, and can summon assistance when violators are encountered and police action is required.

6.5 Participative incentives

- Building trust/social capital between different actors

The Conservancy has taken measures to establish and maintain good relations with local communities and government authorities, such as one-to-one contacts with the public in and adjacent to the area by TNC staff and partners and participating in local community events.

- Participative governance structures and processes such as stakeholder committees, stakeholder consultations, participative GIS planning, etc

Establishment and participation on the Bluepoints Bottomlands Council, which is an organized group of public and private individuals who represent local, state and federal interests and are working together to create a long-term vision for Great South Bay.

- Transparent participation and decision-making processes
- Promoting recognition and realisation of the potential for a given MPA to influence the higher-wider statutory framework, processes and obligations, *i.e.* co-evolution of institutions

the Conservancy's ownership of nearly a quarter of the Great South Bay renders it uniquely positioned to actively engage in and provide guidance to larger collaborative community planning processes that can lead to the sustainable management and conservation of Great South Bay, both inside and outside of our marine conservation area.

7. KEY ISSUES

Lack of integration and cooperation between different agencies and levels of government in managing marine-related activities on Long Island is a main obstacle for the effective management of the GSB. We believe that a if a shared vision for the future of the entire Great South Bay estuary is adopted and endorsed by all relevant levels of government it will become much more clear which activities are part of that vision and which should be phased out or not allowed, and perhaps, which new ones should be promoted. A shared vision will allow for better shared governance of this currently private MPA.

Chumbe Island Coral Park

Governance Analysis

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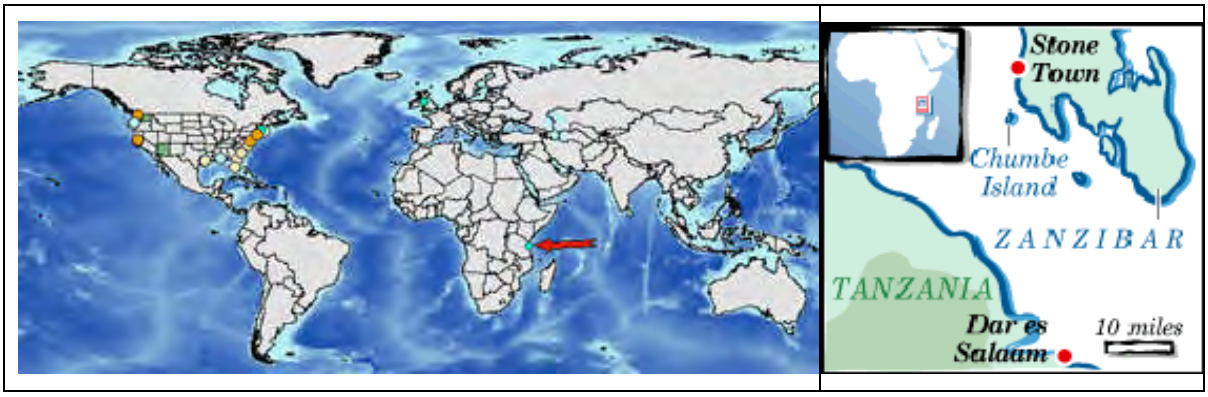

1. CONTEXT

Name of MPA	Chumbe Island Coral Park Ltd, Zanzibar / Tanzania
Size of MPA	33 ha Reef Sanctuary, 22 ha Forest Reserve
Coastline length:	1 km
Distance from shore	ca. 6km from Zanzibar, ca 30km from Tanzania mainland
Population per km^2	Tanzania: 41 million (2008 est.), ca 43/ km^2, Zanzibar ca 500/ km^2
Population growth rate	2,04% (2009 est.)
Per capita GDP	2008 estimate: US$ 497, 2009 forecast: US$ 460 (Bank of Tanzania)
GDP growth rate	2008 estimate 7.4%, 2009 forecast: 2.9% (Bank of Tanzania)
GDP by sector	Agriculture 40%, followed by Mining and Tourism
Labour force/occupation	Ca. 80% Agriculture, 20% Industry & Services (2002 est.)
Unemployment rate	Unknown (majority self-employed in informal sector)
Government type	Multiparty, governing party CCM in power since Independence 1961

2. OBJECTIVES

Chumbe Island Coral Park is a privately established and managed island nature reserve recognized by the Zanzibar Government since 1994. The park is located on and around the small formerly uninhabited Chumbe Island situated west of the larger island of Zanzibar off the coast of Tanzania.

The Legal Gazettement order of the Government of Zanzibar (24.12.1994) defines the area as a No-Take-Area (NTA) where "No fishing or any extractive use shall be permitted in the area so declared". Chumbe is thus

classified as a Class II protected area under IUCN's WDPA listings[47] (Spalding *et al*, 2001).

2.1. Legal Framework

Zanzibar comprises two larger islands (Unguja and Pemba) that form a semi-autonomous region within the United Republic of Tanzania. Zanzibar is autonomous concerning natural resource management and foreign direct investment (FDI). Thus all contracts and agreements were negotiated with the Government of Zanzibar (GoZ) only.

International

The United Republic of Tanzania is party to the Convention on Biological Diversity (CBD), the Nairobi Convention of 1985 (The Convention for the protection, management and development of the marine & coastal environment of the East African region), has announced its intention to increase protection of its seas to 10% by 2012 and 20% by 2025 at the World Parks Congress in Durban in September 2003, and has issued a Blueprint 2050 document[48], where expansion of MPA systems and networks is recommended, along with a supportive legislative environment for MPA establishment and management.

Zanzibar

At the time of the Chumbe MPA establishment (1994) few policies and legislative acts were yet available regarding MPA's.

- ***The*** *Chumbe Reef Sanctuary* ***was gazetted in 1994 through the 1****988 Fisheries Act* ***as a closed fishing area under the GoZ Department of Fisheries and Marine Resources, and management entrusted by Management Agreement to CHICOP for an initial period of 10 years, then extended for another ten years.***
- ***The*** *Chumbe Forest Reserve* ***was established under the*** *Wood Cutting Decree* ***Ch. 121 in 1994 under the GoZ Department of Commercial Crops, Fruits and Forestry, with Management Agreement entrusted to CHICOP for 33 years.***
- ***The later*** *Environmental Management for Sustainable Development Act 1996* ***is the most relevant current act for biodiversity goals and protected area networking. Part VII plans for a National Protected Areas system in Zanzibar, including existing sanctuaries and protected areas, and for a National Protected Areas Board as a consultative authority for policy guidance. Under a 1999 supplement to this Act, a Zanzibar Nature Conservation Areas Management Unit is to be set up that will coordinate the networking of protected areas. Act not yet implemented.***

For Chumbe as a private park, the following laws are also of particular relevance:

- The **Zanzibar Investment Act 1986** sets conditions for foreign direct investment. The Zanzibar Investment Promotion Agency (ZIPA) is the overarching body responsible for implementing this legislation. ZIPA approved the CHICOP Investment proposal in 1993.
- Land is only available for leasehold based on approved investment plans and for a maximum of 33 years. Leases are governed by the **Land Tenure Act 1992** and issued by the GoZ Department of Land and Registration. CHICOP leased a small plot of 2.4 hectares for development on Chumbe Island.

2.2. Operational Management objectives

[47] This is defined as a: *National Park / Protected Area managed mainly for ecosystem protection and recreation:* A natural area of land and/or sea, designated to (a) protect the ecological integrity of one or more ecosystems for present and future generations, (b) exclude exploitation or occupation inimical to the purposes of designation of the area and (c) provide a foundation for spiritual, scientific, educational, recreational and visitor opportunities, all of which must be environmentally and culturally compatible.

[48] Ruitenbeek, J., Hewawasam, I. and Ngoile, M. EDs. (2005)

In the Articles and Memorandum of Association of CHICOP Ltd the aim for which the company is incorporated is:

> *"To manage, for conservation purposes, the Chumbe Island Reef Sanctuary and the Chumbe Island Closed Forest Habitat. This includes educational and commercial activities related to the non-consumptive use of the above mentioned natural resources and the doing of all such other things as are incidental or conducive to the attainment of the above object."*

A **Management Plan 1995-2005**[49] was developed with wide stakeholder participation, and extended and **updated for 2006-2016**[50]**,** both with detailed goals and objectives, which were revised based upon a performance review in 2006, and categorised into the following five themes (IUCN-EARP, 2004): Conservation, Education, Ecotourism, Socioeconomic, Management / Governance.

2.3. Habitats of Chumbe Island

A series of baseline surveys on the Chumbe marine and terrestrial ecosystems were conducted prior and during project development, and findings included in the Management Plans. Permitted uses of the MPA include recreation (swimming, snorkeling, underwater photography), education and research. Extractive and destructive activities, such as fishing, anchorage, specimen-collection (even for research) are not allowed. The Forest Reserve is also closed for any extraction. Access is only along nature trails in the southern part of the island. The north is impenetrable and closed for visitors.

- The **Chumbe Reef Sanctuary** has four key habitats, pelagic, coral reef, coastal shallows and intertidal areas. Baseline surveys identified coral species from 55 genera and over 200 species and at least 432 fish species. One new species of coral was found in Chumbe (*Oulophyllia chumbensis*) awaiting description[51].
- ***The** Chumbe Forest Reserve **has three key habitat areas, mangrove pools, short scrub and a relatively tall (6m) dense coastal thicket covering 90% of the island. It is an undisturbed 'coral rag' forest, which is becoming increasingly rare in the region and indeed throughout the Western Indian Ocean. Fauna include rare and endangered species, e.g. possibly the world's largest known population of Coconut crab (**Birgus latro**), listed as Data Deficient in the IUCN Red List. To date 93 species of birds have been recorded, among them several listed as protected in the Zanzibar Forest Resources Management and Conservation Act of 1996.***

3. DRIVERS/CONFLICTS

3.1. Local Context

- All around Tanzania and Zanzibar, coral reefs suffer from overexploitation and destruction by unsustainable fishing methods, in particular dynamite fishing and beach seining. Other threats are coral mining, pollution by coastal development and intensive agriculture, and the effects of climate change: coral bleaching and acidification of seawater. Protected and formerly unexploited marine organisms, such as turtles, sea cucumbers and sea horses, shells and shark fins are now harvested and exported to distant Asian markets.

- ***Forests are disappearing at a fast rate, for agricultural land, firewood and charcoal, still the most important sources of domestic fuel in rural and urban areas. Endangered and protected species and unexplored indigenous flora and fauna lose their habitats or are hunted or collected for food.***

- From the nineties, the liberalization of the Tanzanian economy has opened coasts and beaches for tourism investments, contributing to the deterioration of coral reefs and coastal forests. In the absence of proper garbage disposal systems, plastic bottles and bags and packing materials litter streets and beaches.

[49] Castle, G. & Mileto, R. (1995)
[50] Carter, E. (2006)
[51] Veron, pers.comm.1997

- Environmental awareness in the general public and GoZ action lag far behind the pace of environmental deterioration, particularly concerning coral reefs. As a result, decades of destructive fishing methods (dynamiting, smashing corals and beach-seining) have been met with little public and governmental concern.

3.2. Threats and mitigation measures

On Chumbe Island, environmental impacts of lodge establishment and operations are closely controlled and monitored. All buildings on the island (7 visitors' bungalows, Visitors' Centre and staff quarters) were constructed according to state-of-the-art eco-architecture (rainwater catchment, grey water filtration, composting toilets, photovoltaic power generation), in order to minimize any environmental impacts. Most systems have worked well throughout. However, there were some challenges:

- Increasing visitor numbers overwhelmed the **grey water vegetative filtration system**, which could not cope with the nutrient-rich kitchen water anymore. With professional help of specialists recruited by the volunteer agencies BESO and SES, the system was modified several times over the last 3 years and works now well.
- A study calculating the **phosphorus budget** of operations on Chumbe Island recommended that compost from the composting toilets and wood ash of the staff kitchen have reached a saturation point and should be removed from the island in order to avoid nutrient leakage into the coral reef. These measures are now implemented.[52]
- **Exotic species** found on Chumbe Island before CHICOP took over management include rats (*Rattus rattus*) and migrant Indian house crows (*Corvus splendens*).[53] Rats were successfully eradicated in 1997.[54] As Indian house crows are attracted by compost heaps, covering these with netting and the occasional services of a local marksman controls the population.
- From 2003, active intervention was required to control **Crown-of-thorn (COT) starfish** and ***Diadema* sea urchin outbreaks,** most likely partially caused by regional eutrophication in combination with overfishing. These outbreaks affected, and continue to affect all surrounding coral reefs between Zanzibar and Tanzanian mainland. The systematic removal in the Chumbe MPA brought the COT outbreak to an effective halt[55], while the *Diadema* population is being reduced regularly.
- During the 1998 El Nino **coral bleaching** event the MPA lost ca 30% of its *Acropora* species, however, recovery and new growth became prevalent within two years[56], restoring the former coverage of the 'reef canopy'.
- Recent research has established that the Chumbe MPA is among the **most resilient reefs** in the Western Indian Ocean region and likely to be less affected by environmental stress, temperature changes and other causes of coral mortality linked to climate change.[57] A related study concludes that the management status of MPAs in the region needs to be re-prioritised based on areas that are both likely to survive climate change related thermal stress and have biodiversity. Chumbe ranks among the highest performers in all these categories.[58]

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[52] Lindstroem (2007)

[53] This species was introduced to Zanzibar in 1891 when Sir Gerald Portal sent a request to the Indian Government in Bombay for 50 scavenger birds to control garbage in Stonetown. By 1917 their population had increased so much that they were already considered pests in Stonetown.

[54] Mammal-specific Brodifacoum anticoagulant poison baits was used at a time when the only other mammals on the island were bat species inhabiting a different canopy level of the forest. Post-eradication the remaining baits were removed and monitoring is on-going using chew-sticks in key locations likely to be attractive to rats (ie.kitchen area and proximal to the bungalows). To date only two re-infestations occurred and the rats found were exterminated in 1998 and 2002. No further rats have been observed since this time.

[55] Lanshammar F, Muhando C. (2008)

[56] Daniels, C., (2004)

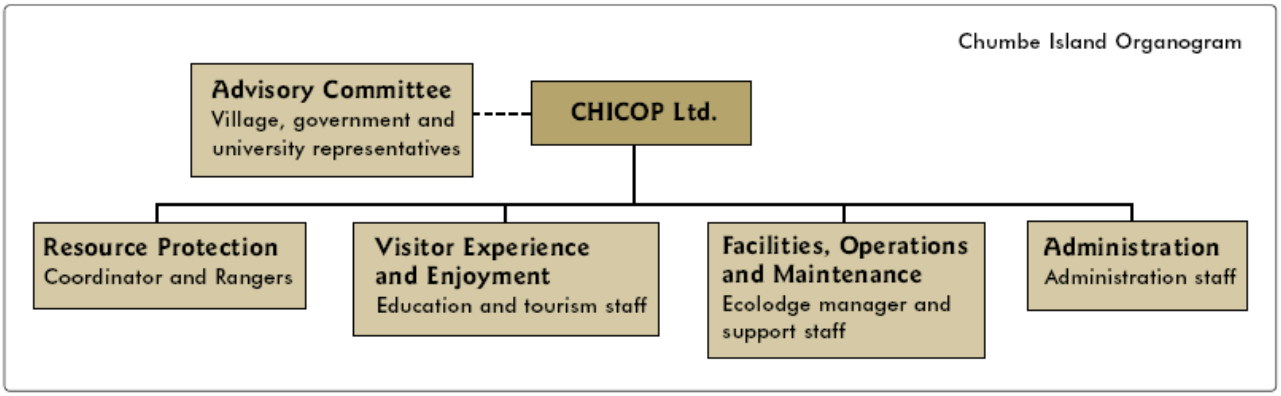
[57] Joseph Maina, Ventijn Venus, Timothy R. McClanahan, Mebrahtu Ateweberhan (2008)

[58] McClanahan et.al. (2007b)

4. GOVERNANCE FRAMEWORK/APPROACH

Organisational set-up

Though a private limited company, CHICOP is in many respects managed like a NGO, especially concerning participation of a wide variety of stakeholders, as well as detailed planning, monitoring, reporting and documentation of actions and outcomes. A simplified organogram of CHICOP appears thus:



© Sheet A3, IUCN-EARP, 2004

The Advisory Committee established in 1995 has two representatives from CHICOP management and nine representatives from different stakeholder groups / institutions, mainly several GoZ departments, research institutions and adjacent villages.

5. EFFECTIVENESS

Due to the island status, relatively small size of the park, the committed work of the Park rangers and the Environmental Education (EE) programs, **enforcement has not been a major problem** throughout project history, except for an episode during the Zanzibar first multiparty election in 1994-95, when the park status was challenged by a group of migrant fishers from Zanzibar town.[59] A meeting of all parties in the Prime Minister's office, and the establishment of the Advisory Committee helped overcome this particular political threat.

From 1993, CHICOP has employed professional expatriate marine biologists as **Conservation Coordinators**, for training the Park rangers and overseeing all research and monitoring programs. Baseline surveys, research reports and monitoring data are available on most flora and fauna of the park. The Park Rangers monitor the park since 1992 and provide continuous data on infringements. The conservation status and threats are thus well documented.

An external consultant was commissioned in 2006 for the update of the Management Plan to 2006-2016, and conducted a detailed assessment of the project performance according to the initial Management Plan 1995-2005, with very detailed and overall positive results.[60]

6. INCENTIVES

6.1. Economic incentives

[59] Nyange-Ame, O., Carter, E.J. & Said, Y. (1997)
[60] Management Plan 2006-2016

6.1.1. Economic incentives for GoZ: taxes, fees and licenses[61]

The revenue generating component (the eco-lodge) operates using commercial principles and is required by law to act as a regular investment, issued with an investment license and liable for all associated taxes, licenses and permits like any regular investment operation, such as:

- Corporate tax (30%) on end of year profits, and variable staff income tax.
- Hotel levy 25% charged on all accommodation revenue accrued from the lodge operations, along with 15% sales tax on all other sales and services.
- VAT 20% on most consumables and supplies.

GoZ policies and incentives intended to encourage ecotourism and non-commercial work, such as tax exemptions, reduced land rent charges etc, are rarely implemented, and this has been a source of conflict between some GoZ departments and the Chumbe management. The non-implementation of legally possible incentives has considerable implications for the replicability of financially self-sustaining MPA's of this nature.

From 1998 to 2008, CHICOP has paid around 700.000 US$ in taxes, fees, licenses etc. With an increased occupancy rate over the last few years, the yearly sum has reached ca. 150.000 US$.

Allowances for government officials

Another more direct, and controversial, incentive for government officials to participate in park activities are the 'allowances', which according to Government regulations are to be paid for any out-of-office work. This is in addition to any travel costs. In particular, teachers expect to be paid in order to take their classes to the island for the day trip. Without these allowances, demand for the free island trips would have been much lower, especially in the early years. Government members of the Advisory Committee who are commonly paid 'sitting allowances' for attending meetings have requested the same from CHICOP.

6.1.2. Economic benefits to local fisheries[62]

Compared to other MPA's (without non-take-areas, NTA), Chumbe has a six times greater biomass of commercially important fish species (Tyler, 2006a). This effect of protection in an NTA is unusually high, as revealed in an international review of 89 other MPA's (with NTA's), where such comparisons revealed a maximum biomass increase of three times greater in NTA's (Halpern, 2003). The most abundant of the commercially important fish include species that have been found to be travelling out of the NTA to nearby fishing grounds.[63]

The enhanced biomass and density of species within the Chumbe NTA is expected to have a 'spillover' effect to neighbouring fisheries areas. A study comparing the Chumbe Reef Sanctuary NTA with fishing grounds outside it that used fish tagging, habitat surveys and interviews with local fishermen, showed that "There was indirect evidence of spillover (net emigration of adult fish) from [the] NTA" and 94% of fishermen interviewed said they believed that fish inside the park do travel out and are caught (Tyler, 2006a: 179). Fish tagged on Chumbe were recaptured in fishing grounds up to 4 km away.

Apart from spill-over effects by adult fish, another direct benefit from NTA's is that the ability to reproduce increases exponentially with the size of each individual fish, thus the spill-over effect of fertilized eggs, planktonic larvae and juveniles will also be significant to surrounding fished areas – even at distances much further from the NTA border.

Another important consideration for local fisheries is the location of Chumbe on the borders to the Menai Bay Conservation Area (MBCA). This is managed by DFMR as a multi use marine conservation area working with local communities, and plans periodical closures and enforcement of fishing gear regulations. With the Chumbe permanent NTA neighbouring the MCBA these programs work as part of the wider MPA network envisaged for Zanzibar in the Blueprint 2050.

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[61] Adapted from Management Plan 2006-2016
[62] Adapted from Management Plan 2006-2016
[63] Tyler, E.H.M. (2006)

CHICOP also provides emergency services to fishermen in distress. As there is no maritime rescue service available in Tanzania, the Chumbe rangers assist fishermen during rough weather, and when boats, engines and sails need fixing. Ranger reports show that since 1994, over 1,000 fishermen (and 160 vessels) have been assisted / rescued by the rangers. Such assistance has had a considerable impact on the positive relations between local communities and the MPA and is an important part of the rangers' work. Rescue activities are also now widely reported through DFMR and local radio media, enhancing Chumbe's PR to a wider audience.

6.1.3. Economic benefits to wider local communities

In addition to the impact of enhanced fisheries locally, and the extensive training and education services described below, Chumbe provides are wide range of other benefits to local communities:

Employment and capacity building

- CHICOP has 43 full-time staff, 63% from adjacent communities, 32% from other areas in Tanzania and 5% expatriate. According to a recent study of the International Finance Corporation, Chumbe employs 200% more staff than the international average staff-room ratio for ecolodges.[64]
- CHICOP proactively employs people from nearby communities. Given their limited formal education and skills years of on-the-job-training are required. All staff - rangers, guards, cooks, cleaners & waiters - are trained in the basics of reef ecology, forest ecology, English language speaking, ecotourism and eco-technology, some get specialized training for the various roles (e.g. teacher training, ranger training, marine ecological monitoring etc).
- There is also proactive employment of women (providing opportunities to a traditionally marginalized workforce in the dominant Islamic culture) such that 40% of the Chumbe workforce is female.

Market for produce and services

Other income opportunities for local communities include providing a market for food, building materials and handicrafts, outsourcing of road and boat transport and craftsmen services during maintenance and casual labour.

6.2. Interpretative incentives

6.2.1. Environmental Education[65]

There is little evidence of traditional reef management by local communities or awareness about the limitations of the resource (Scheinman & Mabrook 1996). Government policies, legislation and management capacity are insufficient to meet the challenges of rapid environmental deterioration, while investment continues to be directed into unsustainable development. Whilst Zanzibar is a coral island, coral reef ecology is hardly covered in school syllabi, and extra-curricular activities, such as field excursions to coral reefs are not organized (Riedmiller 1991).

Therefore, CHICOP offers Environmental Education (EE) for fishers, Government officials, school children, teachers, teacher trainers, university and college students, tourism operators, the general public and all visitors.

The Chumbe Visitors' Centre has a classroom for schools and poster information boards for visiting tourists and a small library on Reef ecology. Nature trails in the Forest reserve, the intertidal mangrove pool and an "underwater nature trail" in the Reef Sanctuary were developed for the Chumbe EE Program. Special large floatation devices, the so-called "Floating Information Modules" (FIMs) were produced for children and unsure swimmers to hang onto for safety. All local school excursions, teacher training workshops and associated activities are provided free of charge at the expense of CHICOP (including car & boat transport, food & refreshments, materials & staff). Up to mid 2009, over 4000 schoolchildren and 750 teachers have participated in this program.

In recent years, fishing committees were established in communities adjacent to Chumbe, and through these various excursions were arranged with representatives from these committees, including women-fishers' groups.

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[64] International Finance Corporation, 2004, Ecolodges: Exploring Opportunities for Sustainable Business, Washington/DC

[65] Updated from Management Plan 2006-2016

The project assessment in 2006 concluded that that the EE programs have developed considerably beyond the expectations of the Management Plan 1995-2005, and this was reflected in the new objectives and management actions of the Management Plan 2006-2016.

6.2.2. Communication and Marketing

As part of marketing efforts, CHICOP has sought support and recognition from the international conservation community from an early stage. Chumbe Island is registered with the World Conservation Monitoring Centre (WCMC) from 1995, and has been chosen for presentation at the EXPO2000 World Exhibition in Hannover/Germany, for its achievements in private conservation area management and the innovative eco-architecture of all buildings. One of the Chumbe eco-bungalows was exhibited in the Tanzanian pavilion in Hannover. Chumbe representatives have also showcased the project in yearly and numerous local and international conferences, including World Parks Congress, ITMEMS, Ecotourism events etc.

From 1997, marketing through the Internet also stresses the conservation orientation of the Chumbe Island project, with a homepage (www.chumbeisland.com) designed to target the right clientele in the 'nature' and ecotourism market.

6.2.3. Awards versus certification

One important experience is that environmental certification offered by various international schemes is costly and thus beyond the reach of small conservation projects and eco-lodges. They normally require payment of consultancy fees and international travel for surveyors. In addition, evaluations of the most common certification schemes have revealed that they have limited marketing value and are thus not very attractive to the tourism industry.[66]

Instead, CHICOP has opted for applying, with great success, for recognized international awards for conservation, responsible tourism and innovative architecture. The most important awards include the UNEP Global500 Award (2000), British Airways Tourism For Tomorrow Award (1999), National Geographic Society Geotourism Award (2008) among many others. This brought excellent free publicity through press and media, travel writers, TV and radio documentaries, Internet exposure, of a value altogether estimated at around 10 million US$ worth of PR in the decade 1998-2008.

International awards also helped to gain recognition at national level. On the World Environment Day of 2004, CHICOP was recognised as "the best investment project for the protection and conservation of marine natural environment and biodiversity for the year 2003/4" by the Zanzibar Department of Environment.

6.3. Knowledge incentives

Monitoring & Evaluation

Baseline surveys of terrestrial and marine species and based on these, Monitoring procedures have been developed and are the responsibility of CHICOP. These include monitoring of coral reefs and sea grass areas (as partner of SeaGrassNet) based on permanent transects in the Reef Sanctuary, recording of poaching events, chew stick monitoring to check rat re-infestation and greywater laboratory analysis. Independent researchers provide important additional data.

As agreed upon in Management Agreements, CHICOP reports on a regular scale to the sectoral GoZ departments and the Advisory Committee. The Agreements contain a clause that allows for revocation in case of serious contravention by the company.

Research

Even prior to the signing of a **Memorandum of Understanding** with CHICOP in 2004, the Institute of Marine Sciences of the University of Dar es Salaam (IMS) in Zanzibar, and foreign academic institutions linked with the IMS co-operation programs conduct regular long-term research. Shorter-term studies have been carried out by a host of academic institutions from around the world.

Research regulations of the Management Plans 1995-2005 and 2006-2016 exclude extractive or destructive

[66] Font, Xavier (2006)

research and establishment of permanent research fixtures in the Chumbe Reef Sanctuary, except transect marker stations and coral transplant experimentation sites. Chumbe has prioritized research programmes that were deemed valuable in aiding management of the MPA, enhancement & restoration research, and monitoring of habitat health.

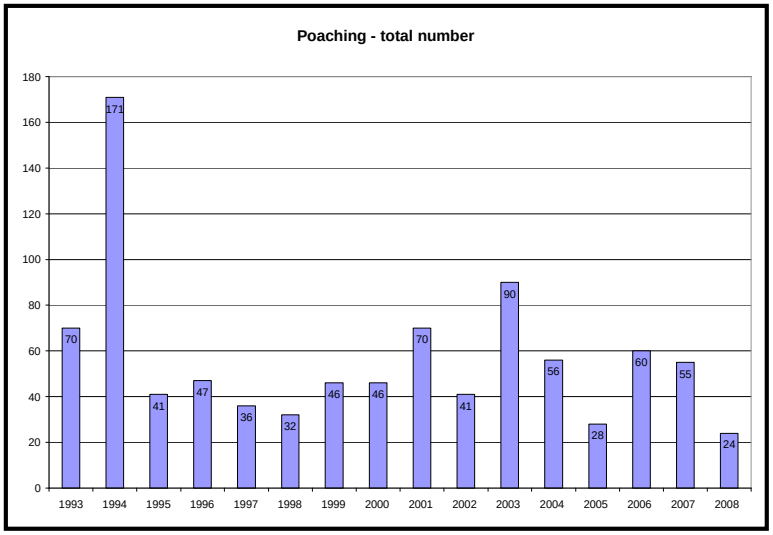
6.4. Legal incentives

The gazettement of the Chumbe MPA and Forest Reserve in 1994 by GoZ and Management Agreements give CHICOP exclusive management rights over Chumbe Island. The Management Plans 1995-2005 and 2006-2016 define objectives, activities, research regulations, and Do's and Don't's both for visitors and staff.

Only non-consumptive & non-exploitative activities are permitted. Research is limited to non-extractive studies, and fishing and non-authorized anchoring in the Chumbe Reef Sanctuary is prohibited. Scuba diving is only permitted for researchers and film crews, and Park Rangers have been employed from local communities since 1992 to patrol the island and ensure that regulations prohibiting fishing and anchorage in the NTA, and guarding of the Chumbe Forest Reserve are observed.

Mooring buoys at MPA boundaries and clear communication between Rangers and local fishers helped enforcement, which has worked well without major problems.

Patrols are done by boat, on foot (at low tide) and from the top of the lighthouse. The Rangers are unarmed and rely on persuading fishers and building awareness. Since 2003, armed police officers are stationed on Chumbe to ensure security, and they have assisted with arrests on a few occasions.



The rangers keep daily monitoring reports of infringements. These have been produced since 1992 and provide key data on attempted infringements into the NTA (see graph).

6.5. Participative incentives

These can be summarized as follows:

- Project negotiations with 7 GoZ departments 1991-94, and regular reporting to all relevant GoZ departments since then;
- Village meetings 1991-92 and thereafter;
- Advisory Committee meetings since 1995, twice per year since 2006
- Activity reports and half-yearly Newsletter on homepage
- Flat company organigram with section managers.

The Management Agreements provide for an **Advisory Committee** formed by GoZ representatives of the Departments of Environment, Fisheries, Forestry, leaders of four neighboring fishing villages and a representative of the Institute of Marine Sciences (IMS) of the University of Dar es Salaam. The Advisory Committee meets at least twice yearly. From 1995, meetings were held according to schedule, to discuss the Management Plans, project progress and any issues. There have been no major disagreements on actions to take so far, though recommendations of the Advisory Committee are not binding for the CHICOP Management.

7. KEY ISSUES

All project components, park management/conservation, education, research, M & E, ecotourism have over the last decade worked without major problems. However, some overarching legal and political

issues remain that affect private investment in conservation and may threaten the sustainability of the MPA on the long run. These are:

- All **land leases** in Tanzania and both **Management contracts** for the protected area are renewable upon expiration. However, like any land lease or agreement in Tanzania, CHICOP has no legal assurances that the lease and management contracts will be renewed after expiration.
- Investment protection under the **Zanzibar Investment Act of 1986** provides limited protection only against expropriation by GoZ, as the law regulates procedures for negotiating for compensation, but has no provisions for challenging expropriation as such.
- The **Environmental Management and Protection Act 1996** (enacted after CHICOP had been established), contains a clause that may in a worst-case scenario weaken the contractual setup of CHICOP, as it allows for cancellation of existing contracts and leases 'for environmental reasons'. However, there has so far been limited political will to implement the law, and the respective institutions have not been created yet.

Baleia Franca Environmental Protected Area
Governance Analysis

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1. CONTEXT

Name: Baleia Franca Environmental Protected Area (BFEPA)
Size of MPA: 1560 km^2
Coastline length: 130 km, 9 km wide

	Brazil (2008 estimates)[67]
Population per km^2	23,34
Population growth rate	1,20%
Per capita GDP (US$)	10,200
GDP growth rate	5,1%
GDP composition by sector	Agriculture:6.7% Industry: 28.0% Service: 65.3%
Labour force by occupation	Agriculture:20% Industry: 14% Service: 66%
Unemployment rate	7.9%
Government type	Federal republic

Table 1: Basic socio-economic indicators at national level.

Brazil is an extremely heterogeneous and unequal country. Santa Catarina State and cities within Baleia Franca Environmental Protection Area (BFEPA) have higher GPD, demographic density and better Human Development Index rate than Brazilian average. There is also a higher demographic increase rate and the predominance of services sector (especially those associated to tourism).

The site has 156,100 hectares throughout 130km of coastline. Nine coastal cities in the south of Santa Catarina State are somehow affected by the BFEPA governance system, including: Florianópolis, Palhoça, Paulo Lopes, Garopaba, Imbituba, Laguna, Tubarão, Jaguaruna and Içara. Approximately 790,000 people lives within these 9 cities.

[67] Figures taken from the CIA world fact book https://www.cia.gov/library/publications/the-world-factbook/geos/br.html

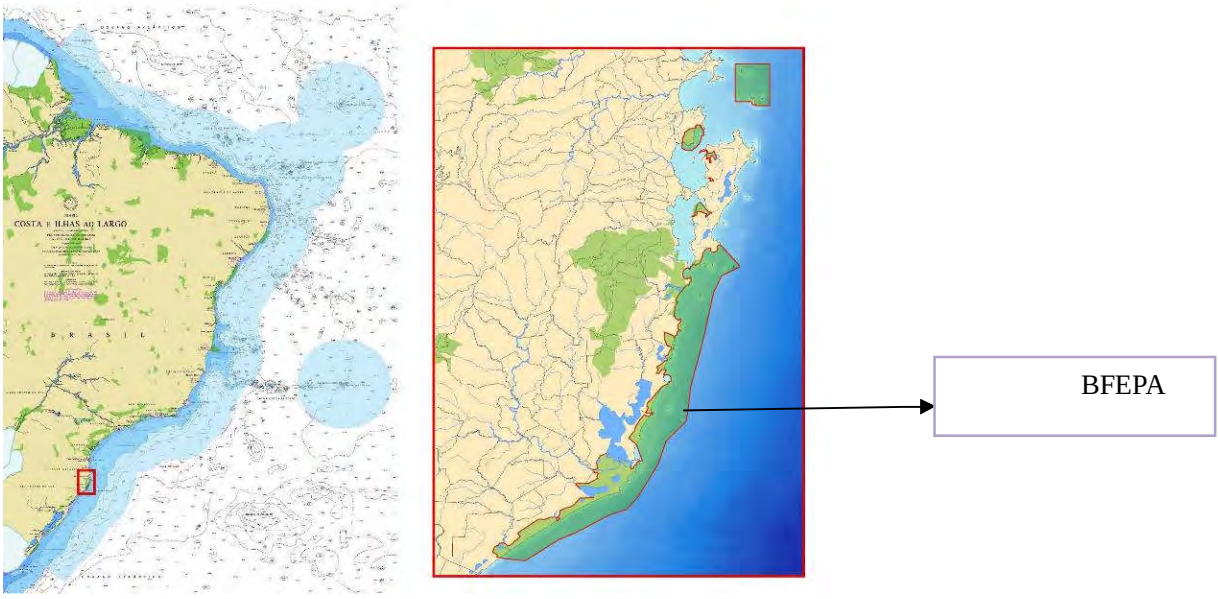


Figure 1: Baleia Franca Environmental Protected Area

The socioecological configuration of all nine cities under the influence of BFEPA governance system share several similarities. In general terms, the region abounds in biodiversity; has exceptional aestetic value; shelter traditional artisanal small-scale fishing and agriculture communities with a strong interest in safeguarding cultural traditions and; has an expanding ecologically predatory and socially exclusionary tourism industry.

Besides a large proportion of the BFEPA is marine, a series of coastal lagoons and lakes are also present as an important source of fish food.

And 20% of the BFEPA's territory is made of terrestrial environments of high conservation value (e.g. sandy dunes, *restinga* vegetation, atlantic rainforest, etc). Most terrestrial environments at BFEPA are located in the central to southern area of the site. Northwards of the BFEPA, the terrestrial ecosystems are protected by another PA, the Serra do Tabuleiro State Park, a fully PA designated in 1975 (87,475 hectares).

Since the implementation of the BR101 coastal highway in the 70s', the urbanization process brought several environmentally harmful development projects to the area. These gave rise to numerous conflicts between local fishing communities and entrepreneurs guided by a economic development mindset (NMD, 2007).

2. OBJECTIVES

The Brazilian government has recently developed national policies, programs and plans attempting to tackle its international and national environmental obligations. The National System of Conservation Units (SNUC/2000) and the National Police for Protected Areas (PNAP/2006) are examples of recent initiatives. The SNUC regulates the processes of designation and management of Protected Areas (PA) in Brazil. There are 12 possible PA categories divided in two major types: 1) integral protection, where no direct use is allowed, and; 2)

sustainable use, whereby exploitation of natural resources is allowed but controlled within different governance arrangements.

The EPA category resembles the 'VI' type of PA according to IUCN categories. It was defined in the SNUC as:

> "(...) generally extensive areas, with a degree of human occupation, with ecological, aesthetical or cultural attributes especially important for quality of life and well-being of human populations, and with the basic objectives of protecting biological diversity, order occupation processes and safeguard the sustainability of natural resource use." (SNUC, Law nº 9.985/2000, Art. 15).

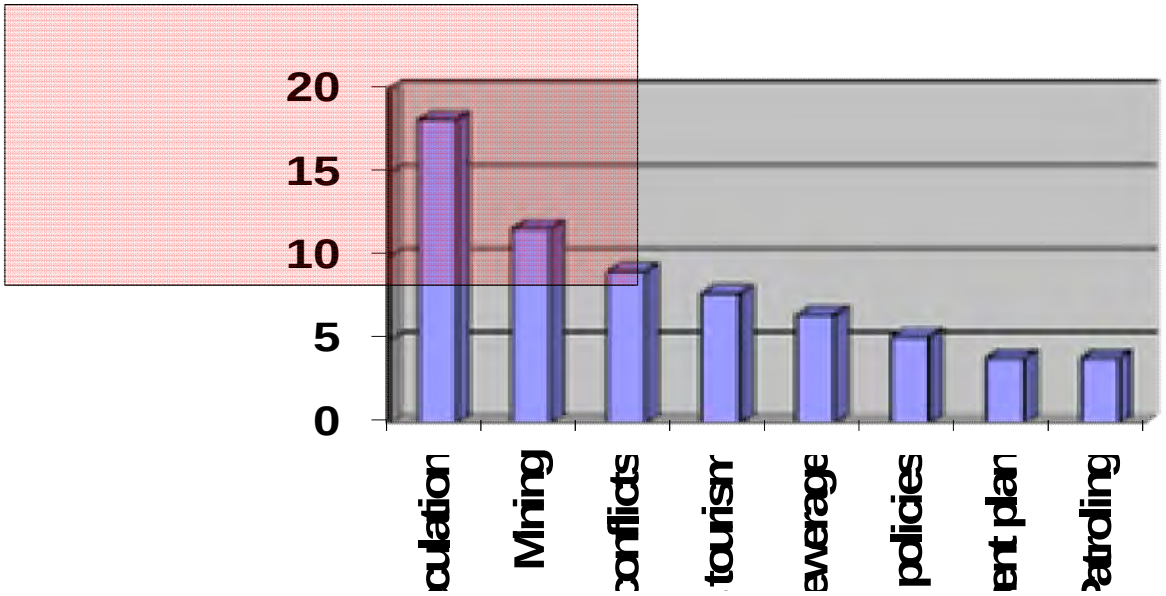
The designation of the BFEPA is part of this effort to fulfil Brazil´s international and national environmental obligations. It was designated in 2000 out of an environmental movement leaded by the "Baleia Franca Project", which is coordinated by the International Wildlife Coalition, a Brazilian NGO.

The objective of BFEPA is to "protect, in Brazilian waters, the Southern Right Whale (*Eubalaena australis*), organize and guarantee the rational use of regional natural resources, organize the occupation and water and land use, organize recreational and touristic use, activities of research and the traffic of boats and airplanes." (Federal Decree s/n, 2000: Art.1).

3. DRIVERS/CONFLICTS

The main pressures to the BFEPA natural resources are related to mass tourism, disordered land occupation and predatory fisheries. Furthermore, rice agriculture and coal mining in the outer borders of the BFEPA threatens the sites' natural resources.

According to the perception of 42 Management Council representatives (Graph 1), the main fragilities to the BFEPA are: 1) land speculation and disordered land occupation; 2) mining and; 3) conflicts in fisheries management (Macedo, 2008).



Graph 01: Problems and conflicts in BFEPA – councelours view (Macedo, 2008)

The most cited fragility - land speculation and disordered land occupation - refers to the construction of houses in inappropriate areas, i.e. fragile and legally protected rainforest ecosystems. Respondents have also linked this fragility to the increase of the housing sector derived from mass tourism.

To local people, tourism is seen from two angles: it brings immediate benefits, i.e. new jobs, money from

house rents, increase of commerce with local goods and services. On the other hand, mass tourism also brings disordered land occupation, drugs, and changes in local traditions (IBAMA, ICMBio and MMA, 2007).

Development grounded in mass tourism and economic growth at all costs is stimulated by some municipal and State public institutions. Several conflicts between government executive institutions and the BFEPA arose because of diverging development perspectives.

The second most cited fragility at BFEPA by MC counselors was mining. There are three different mining activities in the area: sand mining in dunes, calcareous shells in the lagoons and coal mining in the underground.

In Brazil, there is a national Law forbidding mining activities within Environmental Protection Areas when "impacts or degenerates the environment and/or brings danger to local biota and people" (CONAMA nº 10/1988, art. 6º). However, as 'impacting or degenerating the environment' can raise different interpretations on the light of differing interests, the mining issue at BFEPA is currently in a judicial battle.

The third most cited problem is related to conflicts in fisheries, an issue frequently discussed in MC meetings. Fisheries issues have also been dealt during parallel working groups encounters, and more recently (December/2007), a Technical Chamber within the Management Council was officially designated at BFEPA. Some of the most relevant issues evolving small-scale fisheries are conflictual relations with industrial fisheries, divers and sport fishermen; conflicts with exotic shrimp farming; conflicts amongst fishermen guilds; irregular distribution of "*defeso*" (seasonal closure payments); lack of patrolling for illegal fishing; conflicts with water sports over use of the lagoon; conflicts with mussel extraction.

4. GOVERNANCE FRAMEWORK/APPROACH

ICMBio (Chico Mendes Institute of Biodiversity Conservation) is the federal agency responsible for protected areas in Brazil. The country has 304 federal protected areas, a total of 800.000km².

However, when thinking about governance at BFEPA, it is necessary to outline two specificities of this protected area category: (1) they aggregate both public and private land; (2) there are several public bodies of varying levels (federal, state and municipal) responsible for different issues in the territory.

Therefore, when analyzing governance in this site we must note it is an intricate system which goes beyond ICMBio, with various public bodies evolved, besides land owners, NGOs and social movements, all influencing the area dynamics and socioecological characteristics.

In this complex and dynamic context, the role of the government body responsible for the BFEPA management is to articulate different organizations, sectors and their interests, pursuing the MPA's objectives.

In Brazil, this multi-institutional articulation is done through a public forum denominated "Management Council" (MC). According to SNUC, Management Councils are binding participatory stances at every PA. They have to bring different stakeholders with a relation with a particular territory to: 1) follow the elaboration, implementation and revision of management plans; 2) facilitate the multiple-use/interest of the area by different resource users and; 3) discuss and devise guidelines and actions to integrate, optimize and turn compatible the co-existence between local populations living in the borders or within the PA, with its objectives.

As the BFEPA was designated after a preservationist movement, the early stages of implementation had no community participation. Until 2003, BFEPA management decisions were almost exclusively taken by IBAMA/ICMBio. Only after a new manager and more human resources were assigned to the site, the implementation of a Management Council (MC) was placed in the forefront agenda. BFEPA MC became one of the more effective in Brazil (see details in "Participative Incentives").

5. EFFECTIVENESS

As BFEPA has very limited financial and human resources, the effectiveness of its laws and rules largely depends on their legitimacy during the negotiation phase; this is why an emphasis is placed in the participatory assessment of main existing problems and conflicts, as well as in the process of building strategies to tackle them. The main stance of collective construction is the MC and its technical chambers.

As it was said before, the three main problems in BFEPA are related to land speculation, mining and fisheries management issues.

Concerned with the first problem the MC has created the Land Occupation Technical Chamber. Thus, despite the efforts already made, with a coastal development model based on mass tourism and economic growth at any cost, the problems persist and are beyond MPA´s control.

The MC has also created a Technical Chamber to mediate the mining problems. Despite this problem still persist, we can see as an advance that the main stakeholders related to this sector are involved in the management of the BFEPA and are developing a collective effort to dialogue and better regulate this activity

Regarding fisheries management issues, we also notice a series of improvements brought by the BFEPA. Since 2008, a fisheries management plan is being discussed with fishermen communities from nine cities within the BFEPA. This process is being mediated by an external consultant. The construction of this management plan is using participatory methods to identify conflictuous areas, fishing grounds and ecologically important areas (e.g. spawning areas).

During the fieldwork, the consultant found a context of complete absence of the environmental agency responsible for the BFEPA at two of the three regional sectors. Problems with the representation of local leaders at the MC were also evident. These problems triggered a process of mediation of several collective meetings and individual encounters between local fishermen and BFEPA officers.

A recent advance in the dialogue between local people and BFEPA officers was done in the south sector. Relations of trust and partnership started to be forged with an important institution, namely Pastoral da Pesca. This is a fishermen association linked to the Catholic Church, acting in different sites along the Brazilian coastline. This process is still fragile and uncertain, but there is a hope that by working in partnership it will be possible to empower and legitimize local peoples' participation.

The contract with the consultant responsible for this articulation will end in December 2009 and no funds are yet secured for this purpose. Thus, the gradual engagement of BFEPA officers in this process will be key in the long run, as well as the integration of initiatives and partners from the several other projects cited in this manuscript.

Transparent and alternative pathways are gradually arising to cope with the complexity and extensive area of the BFEPA, taking participation and communication beyond the limits of the MC. The individual approach adopted by the BFEPA main officer in charge since 2003 is certainly key to the positive steps forward made recently. Institutional partnerships are also very important to enhance the participative process and share responsibilities to cope with limitations and gaps of the environmental agency. Nevertheless, there are still areas of the BFEPA with no much local articulation and partnerships, posing considerable challenges for the future.

Effectiveness scale: 2 (some impacts partly addressed but some impacts not yet addressed). Please note that the authors of Voume 1 classified the effectiveness as 1.

6. INCENTIVES

Participative incentives

The institutional forum of participative process in Brazilian PAs is the Management Council. At BFEPA, the

MC was implemented by a multi-institutional team[68]. This initiative turned out to be a reference project to protected areas in other regions of the country. The methodology used to implement a MC at BFEPA included the following steps: 1) dividing the BFEPA in three sectors because of its large area and heterogeneous characteristics; 2) organization of sectorial meetings and small workshops (n=41) with a broad range of stakeholders. The objective was to communicate the existence of the BFEPA, the importance of implementing a MC and discussing potential composition and structure of the MC; 3) sectorial meetings and elections, once it was defined that to each of the three sectors (local people and other resource users, governmental agencies, and NGOs) should be assured equal number of seats at the MC.

Seven principles or criterias were defined for MC elections: 1) to seek regional parity in the three regional sectors; 2) enable participation to all resource user groups (organic and traditional agriculture, small-scale and industrial fisheries, mining, honey-bee producers, tourism, industry, commerce and etc); 3) encompass both multi-regional and local institutions; 4) prioritize institutions representing traditional communities and those practicing conservation and sustainable use of resources; 5) prioritize institutions that took part of the capacity building course; 6) prioritize institutions with greater representativeness (number o partnerships, projects, intervention area, community engagement, etc) and; 7) prioritize those institutions with a history of partnership with the MC.

In 2008, with the support of a consultant, there were several meetings to create an action plan to each priority and polemic/conflictuous issue of the BFEPA: tourism, small-scale fishing, land occupation and mining. These conflicts and issues are recurrent at MC meetings and thus were recently incorporated as structuring themes in the management of the BFEPA. Technical Chambers (TC) were then designated to deal with each action plan. TCs are designated by the MC to deal with particular issues, and can include other interested institutions and parties other than those possessing seats in the MC. And, in each Technical Chamber there are Work Groups (WG), responsible for specific and temporary problems.

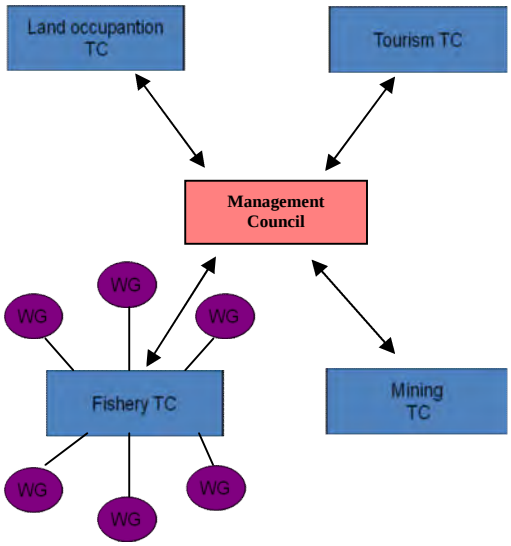


Figure 02: BFEPA Management Council institutional design

[68] IBAMA, Transdisciplinary Nucleus on Environment and Development – Universidade Federal de Santa Catarina, Gaia Foundation, Lagoa de Ibiraquera Agenda 21 Forum and Cooperativa Caipora.

Economic incentives

The BFEPA has very limited resources, what turns it unable to lead the direct implementation of economic incentives. Therefore, officer's efforts are oriented to support and articulate other institutions which aims to establish a sustainable territorial development model in the region.

As an example, we mention the partnership between the BFEPA authority and the project "Sustainable Territorial Development in the Coastal Zone of Santa Catarina". This project is a multi-institutional partnership between the Trans-disciplinary Nucleus on Environment and Development (Federal University of Santa Catarina), the Santa Catarina Farming Research and Rural Development Agency (EPAGRI) and the Chilean NGO Latin-American Center for Rural Development (RIMISP).

The general idea of the project is to bring knowledge on the viability of a sustainable territorial development process in the southern coast of Brazil. This initiative is mapping experiences of sociotechnical innovation which are locally rooted and socioecologically sustainable. Its objective is to integrate and strength community-based tourism, agroecology, small-scale fisheries and artisanal craftwork with the local cultural identity.

Interpretative Incentives

A communication consultant was contracted to increase communication amongst MC counselors and local people. This was an important interpretative incentive, once it is giving broader awareness to the objectives and actions developed by the BFEPA. The strategy adopted consists of producing media *releases* and distributing them through e-mail to local radios, television channels, newspapers, magazines and regional websites. The news includes ongoing events and actions developed by Working Groups and Technical Chambers of the BFEPA MC. Information derived from MC institutions, as well as news dealing with ongoing issues affecting the BFEPA are also communicated.

A BFEPA MC Blogg[69] was also designed in partnership with the Communication Working Group. The website is used as an important mechanism to better communicate ongoing discussions amongst MC counselors (42 institutions) and with local people. It allows the implementation of surveys on topics of interest, and the possibility to post commentaries on the content. MC counselors will also receive training in the use of this new technology. Besides using internet technology for communication, an informative newspaper is issued every month. Folders, radio spots and a booklet are also being published.

However, the contract with the communication consultant ends in December 2009 and no budget is currently secured on a continuous and long-term basis. Therefore, BFEPA officers and MC counselors will be trained to independently continue with the communication program. Nevertheless, the perception of the communication consultant is that the communication potential of large companies in the region is far greater. The solution would be investing in a pluralistic, democratic and decentralized communication process. Thus, MC actions would become more transparent, offering greater legitimacy whilst provoking social control.

Despite the optimistic communication scenario, it is still early to evaluate its success, which will depend how seriously MC counselors and BFEPA officers engage themselves in the process.

Knowledge incentives

In 2005/2006, members of the BFEPA MC received compulsory training by educators of the Environmental Education Nucleus of IBAMA and the Transdisciplinary Nucleus on Environment and Development

[69] http://apadabaleiafranca.blogspot.com/

(NMD-UFSC). The objective was to enable critical thinking about the implementation of participatory public environmental management processes. The course included knowledge about existent legal management instruments (laws and policies) and integrated and participatory planning processes.

When enquired about how to improve MC functioning, counselors' first recommendation was the provision of capacity building courses (Macedo, 2008). The perception of the MC as a public teaching-learning platform is widespread amongst MC counselors. The importance of capacity building processes is also noted by Dagnino (2002), which recommends an association between technical and political learning in courses directed to MC representants.

Brazilian legislation foresees MC representants renewal every two years. At BFEPA, the first renewal occurred in 2007. It is worth noting that two thirds of the previous representation was maintained; this measure was understood as an important mechanism to assure the maintenance of a continuous learning process of ongoing participative management initiatives.

Legal Incentives

According to Brazilian legislation (SNUC), protected areas should implement a Management Plan (MP) after 5 years of its designation. However, most protected areas in the country do not have its main management instrument.

This is the case of the BFEPA, which has no MP after 9 years of existence. The site therefore has no zoning and comprehensive regulations and management programs. The result is fragmentation and incoherence on the implementation of public policies in the area encompassed by the BFEPA. For instance, different levels/scales of government (city, state or national) establishes diverging incentive policies and regulations or duplicate efforts when addressing similar issues. This problem is exacerbated at BFEPA due to its diverse and complex governance system.

Therefore, ICMBio actions in BFEPA are based on existing legislation (federal, state and municipal) and norms published within the sites designation Decree. The national 'Forest Code' and 'Municipal Directive Plans' are examples of existing laws used at BFEPA territory.

Therefore, without a well-structured and broad legal basis to orient management at the territory-level, officers are obliged to formulate specific public policies.

An example of such specific policy is the elaboration of the IN IBAMA 102/2006, a federal norm which regulates nautical activities within the BFEPA to avoid whales disturbance.

With the increase of the 'whale-watch' oriented tourism, concern about the impact of nautical activities pushed the proposal of a new set of rules by BFEPA officers. The new body of norms determined areas where only land-based whale-watch are allowed, and refugee areas where both land and embarked whale-watch are forbidden. This measure was severely criticized by the touristic sector, politics and other enterprises, which felt prejudiced. After a round of political articulation and pressure, the presidency of the governmental environmental agency decided to revisit the norm and open the dialogue with the MC. Discussions were intense, time and energy-consuming to BFEPA officers, but enabled further legitimization and recognition of this particular legislation and the MC as a robust participative platform. A perception shared by BFEPA officers is that the occasion was also instructive for the central administration of the environmental agency.

Another legal incentive being promoted at BFEPA came with the project 'Santa Catarina Coastal Observatory', a partnership between the Ministry of Justice, NMD-UFSC and UNIVALI. The project's objective is to "organize and coordinate a technical-scientific network to support the Ministry of Justice (at the federal and state level) in actions towards more participative-democratic conflict management approaches."

Cross cutting issues/factors

In addition to the incentives cited above, it is important to outline the role of the current officer in charge of the BFEPA as a leader. In 2003, after the presidential victory of Luis Inacio Lula da Silva, Maria Elisabeth Carvalho da Rocha was nominated to head the BFEPA, a position she still holds.

Coming from social movements of the central area of the BFEPA (Garopaba city), we can consider her a fundamental factor for narrowing the relationship with local communities.

With a long-term view of the process, a clear social compromise, substantial effort and historical credibility acquired in the region, she could slowly break existing resistance between local populations, especially amongst those historically excluded of decision making processes, such as traditional fishermen and small-scale farmers.

As a consequence, we observe today that these sectors are going through a process of identity recognition and recovery and are engaging in the BFEPA governance. Consequently, the credibility and effectiveness of BFEPA regarding the accomplishment of its socioenvironmental objectives is also increasing. In turn, the resistance of traditionally dominant economical sectors is also increasing.

7. KEY ISSUES

Since it was designated (2000), we noticed that BFEPA went through a slow but steady process of structuring as a MPA. The number of government staff allocated, for instance, went from 2 (2000) to 4 (2003) to current 7 people.

Regarding government financial resources allocated to the MPA management, values are also extremely low, varying from 5,000 to 15,000 dollars per year. In the past three years money derived from environmental compensation processes were allocated to the BFEPA, enabling the acquisition of an office in 2007, some equipment and payment of consultancy work for key topics.

However, even with slow advancements, the number of people and financial resources continues very low considering the enormous size of the MPA (1560hm2). The picture is worst if we consider that the area is going through profound socioeconomic transformations and is permeated by a gigantic quantity and diversity of conflicts and pressures.

In this context, it is practically impossible to create rules that are only restrictive and based solely on criteria and interest derived from the managing agency (ICMBio); in a MPA with limited enforcement capacity, rules will only be effective if they are the result of a social pact.

Thus, the efforts of ICMBio from 2003 onwards focused in establishing partnerships and collectively building laws and regulations for the MPA.

Participative incentive are, therefore, the central axis of the MPA; it is based in this axis that all management efforts are established; through the management councils, technical chambers and working groups, regulations and priority actions are planned and strategies for delivery, including necessary partnerships, are defined.

This strategy has resulted in many positive results, of which we consider the most important the construction of the MPAs' identity and its recognition by different social actors involved in the area. We can perceive that, slowly, this MPA is being recognized as a territory, with its particularities and specific objectives.

Nevertheless, we observe that this strategy encounters a series of limitations. In face of big economic interests, which are better structured and count with a much greater political power in varying levels and spheres of government it is extremely difficult to construct and make viable social pacts which conciliate development and conservation.

We therefore consider urgent the allocation of further human and financial resources from higher levels of government so the BFEPA can adequately pursue its objectives.

Overall, it is considered that the following represent the key priorities to improve governance in this case:-

- More efforts in legal incentives, specially in the elaboration of a Management Plan, which has to be the result of a symbiosis of different territorial planning instruments existing in the area such as Municipal Director Plans and the State Coastal Management Plan;
- More economic incentives, which may help the strength of a lifestyle associated to sustainable use of resources, like familiar agriculture, artisanal fisheries and community based tourism; this lifestyle is deteriorating due to a 'development at all costs' model;
- Maintenance of interpretative and knowledge incentives;
- Continuity of participative incentives, which are the central axis in Environmental Protection Areas.

Pirajubaé Marine Extractive Reserve
Governance Analysis

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1. CONTEXT

Name of MPA: Pirajubaé Marine Extractive Reserve
Size of MPA: 1,444 hectares
Coastline length (where applicable):
Distance from shore: coastal/shallow marine

	Brazil (2008 estimates)
Population per km^2	23,34
Population growth rate	1,20%
Per capita GDP (US$)	10,200
GDP growth rate	5,1%
GDP composition by sector	Agriculture:6.7% Industry: 28.0% Service: 65.3%
Labour force by occupation	Agriculture:20% Industry: 14% Service: 66%
Unemployment rate	7.9%
Government type	Federal republic

Costeira do Pirajubaé is a neighborhood located in Santa Catarina state, city of Florianópolis, in the continental face of the Santa Catarina Island known as Baía Sul. The water adjacent to Costeira do Pirajubaé is marine with strong freshwater influence by the estuary of Tavares River. It is a shallow embayed area, with the presence of several sandy shoals, known locally as 'baixios'. This estuary shelters the southernmost mangrove ecosystem of the Atlantic Ocean. The region is a nursery ground and is abundant in fishery resources (fishes, mollusks and crustaceans), the basis for a diverse set of local small-scale fisheries.

Costeira do Pirajubaé is immersed in a highly urbanized environment, sheltering the main public highway to the south of the Florianopolis Island and the international airport. The traffic of cars is intense. Urbanization also attracted new families from other regions of the state, some of which found economic shelter in local fisheries in the past decade. The main economic activities at Costeira do Pirajubaé are general services and small-scale commercial and subsistence fisheries.

1.1 **A brief history of the local socioecological system**

Local fisheries were significantly diverse in techniques and areas of exploitation prior to the designation of the Pirajubaé Marine RESEX in 1992. The use of gillnets and castnets for shrimps and finfishes was very common (e.g. mullets *Mugil* sp; snook *Centropomus* sp; drummers Sciaenidae; catfishes *Genidens* sp, etc). We highlight the importance of the cast net shrimp fishery locally known as 'pegada', practiced in the immediate coastal areas and sandy shoals of the CP. The area was regarded as THE main shrimp nursery grounds of the entire region and the 'pegada' fishery was a very important constituent of the local cultural identity. A profound knowledge on shrimp migration, seasonality and other ecological aspects were thus an important part of the cultural capital of the fishing community.

Informal norms and rules (local institutions) governing the marine area and its natural resources were present. We found evidences that gillnets were prohibited in some areas; dead wood remnants in the estuary were also not fished because of their nursery and protection role for finfishes; bells used to be played in the 50s at a given time at night to communicate the need to interrupt shrimp fishing activities.

The extraction of berbigão was not significantly relevant as a fishing resource in the past, and was only consumed eventually. During the 80s, interest on berbigão as a fishery resource significantly increased and turned to be one of the major local exploited resources. Firstly, the exploitation of berbigão rose because of a demand from a few external fishing companies. In this period, a local fisherman played an important role in obtaining know-how and techniques for the extraction of berbigão in a larger scale. This particular fisherman has also played a key role in organizing and leading a small group of berbigão fishermen (<20 people) in the designation phase of the RESEX. Besides fishing, he also intermediated the negotiations with the external fish food companies, and was the first president of a local fishermen guild established to support the implementation of the Pirajubaé Marine RESEX.

In the same period (around 1991), DEINFRA (Santa Catarina State Infrastructure Department) was starting to articulate the construction of the claimed area that would shelter a coastal highway to connect the central part of the city to the international airport. Both processes (RESEX and highway environmental licensing) were conducted in the same period by IBAMA, the federal government environmental agency. The construction of the claimed area was fully finished by 1996.

The project presented by DEINFRA planned to claim 200m of the seascape, but ended claiming around 400-500m of the littoral zone. This very large stretch of coast was a very important fishing ground for the community. To worsen the situation, the sediment used in the project was dredged in 1995 from the main sandy shoal or 'baixio' existing in the interior of the already designated Pirajubaé Marine RESEX – a third of the sandy shoal is believed to have had dredged out (100ha or seven million cubic meters) (Tremmel, 1995). This sandy shoal is regarded by some as the 'heart of the RESEX', because of its regional ecological importance as nursery ground for shrimp, mollusks and finfish.

Some of the immediate impacts of this enterprise were the extirpation of nursery grounds of fish resources (finfish, mollusks and crustaceans), radical changes of the coastal landscape and seascape and major changes in local hydrographical circulation patterns. In a very short period of time, the geography of the CP was substantially changed. Some of the direct results to the local people were:

- Extirpation of fishing territories traditionally appropriated by local fishermen;
- Profound disbelief of local population on the public sector (DEINFRA and IBAMA);
- Social and political fragmentation of the community;
- Acceleration of loss of the local culture and identity (acculturation);
- Local ecological knowledge lost part of its functionality and had to adapt to the new ecological system created;

Furthermore, the 'pegada' fishery was practically extinct as most of the area where it was traditionally practiced was claimed for the new highway. Most wooden canoes – an important material symbolic reference

to the local culture - rotten during the highway construction.

Figure 1: 'Berbigão' or 'Vongoli' mussels, *Anomalocardia brasiliensis.*

Figure 2: Costeira do Pirajubaé, Florianópolis city, Santa Catarina state, Brazil. The darker colour in the center of the image shows the dredged area above the sandy shoal. The extracted sediment was used to claim the coastal area (right) for the construction of a highway to connect the centre of the city to the international airport (centre, below).

Figure 3: Tavares River and local fishermen households.

2. OBJECTIVES

Extractive Reserves (RESEX) arose in Brazil in mid 80s', after an intense social movement in the Amazon to reconcile the extractive use of the forest (rubber tappers) with nature conservation. Conceptually, in RESEX the state contractually delegates exclusive rights of use and access to natural resources to a given traditional community. It is assumed the existence of a traditional community with a well-defined territory of cultural reproduction. As RESEX were originally born out of the need to recover and strengthen a local traditional culture, to hold the right of access and use of the area implies having a traditional community identity.

The primary objective of every RESEX is to protect local culture, including its productive practices closely related to natural resources. Nature conservation is also important, the state's role being to guarantee that local economies do not affect the integrity of the natural environment.

Pirajubaé Marine RESEX was designated in 1992. Community mobilization supporting the designation of the Pirajubaé Marine RESEX arose from a group of approximately 12 mussel fishers. Objectives were to safeguard the extractive use of the berbigão *Anomalocardia brasiliensis*, and the protection of mangroves and sandy shoals.

3. DRIVERS/CONFLICTS

Together with urbanization, the increasing influences of external markets in the daily live of fishermen are major drivers of biodiversity conservation conflicts currently affecting the local socioecological system.

Although the RESEX was designated to primary deal with mussel fisheries tradition, there are several fishery resources under exploitation by different gears in the same area. This raises issues of who are the true holders of the RESEX rights. The complex dynamics of an urban and heterogeneous social context differs Pirajubaé from homogenous traditional communities typical of terrestrial RESEX counterparts. Some of the main activities/conflicts are:

3.1 **Mussel extraction**

Mussel extraction is the main resource being harvested within the borders of the Pirajubaé Marine RESEX today. Around 20-30 extractivists (and their families) are exclusively engaged in this fishery. This is the core beneficiary group of the RESEX.

3.2 **Small-scale fisheries**

Several fishing practices are present in the area adjacent to the borders of the MPA. The range of fishermen profiles is heterogeneous, dynamic and still little understood (at least by external agents).

3.3 **Crab fisheries**

A few families are currently exploiting crabs *Ucides cordatus* in mangroves within the Pirajubaé Marine RESEX, though this is a prohibited activity within the area.

3.4 **Pollution**

The surrounding urban environment offers a source of pollution of a variety of sources, including oil and fuel from the coastal highway, streets and gas stations that are washed down to the estuary, domestic and industrial sewage water.

3.5. **Housing expansion**

Residential and industrial buildings surround the vicinities of the Pirajubaé Marine Extractive Reserve. Attempts to invade and build in the borders or even within the MPA are increasingly frequent, harming the mangrove ecosystem.

Figure 3: Claimed area at 'Costeira do Piraubaé'. The area was a very important fishing territory to local fishermen (source: RESEX Pirajubaé).

Figure 4: Mangroves, rivers and the marine seascape of the Pirajubaé Marine Extractive Reserve (source: RESEX Pirajubaé).

Figure 4: Women processing Berbigão mussels for commercialization.

4. GOVERNANCE FRAMEWORK/APPROACH

The designation of any RESEX has to follow community demand and articulation. Management is shared amongst local stakeholders, but the balance of power favors traditional populations. Governments' role is to mediate or facilitate participatory processes and to guarantee sustainable use of the area. The main legal mechanisms currently available to implement RESEX are Deliberative Management Councils (DMC) and Management Plans (MP) (none yet present at Pirajubaé Marine RESEX). RESEX DMCs have deliberative nature, an exception amongst other Brazilian protected area categories. This implies that decisions are fully taken during DMC meetings, with 50%+1 of traditional people's representation. The MP has to be built in a participative manner and describe the specific objectives and means to manage the RESEX.

In the year 2000, the Brazilian Ministry of Environment published the National System of Conservation Units (SNUC, 2000). This legislation established the directives for protected area designation, implementation and management in the country. Brazil also signed to the Convention on Biological Diversity, and has recently published a National Policy for Protected Areas. Gerhardinger et al. (under review) have identified several structural flaws in the implementation of a National System of Marine Protected Ares in the country. At Pirajubaé Marine RESEX, the current political/administrative context mirrors most of the flaws listed therein.

4.1 **Contributions of the Environmental Education Program to the Pirajubaé Marine RESEX governance system**

By the end of 2007, the context was one of complete disarticulation amongst stakeholders (local people, environmental agency, universities, government bodies, etc) and no actions were in place in order to push forward the implementation of Pirajubaé Marine RESEX. Furthermore, several people (within academia and the environmental agency) were questioning (some still are) the validity and viability of the Pirajubaé Marine RESEX provided it is impossible to think of a RESEX without local collective action from a 'traditional community' to push forward its implementation.

The Universidade do Vale do Itajaí (UNIVALI) has been developing a large environmental monitoring program in the Costeira do Pirajubaé since 1996. In the past 13 years research was conducted within 14 disciplines (e.g. fishes, crustaceans, mollusks, water quality, mangroves, sediments, phytoplankton, nutrients, etc). This broad environmental monitoring program is delivered through a contract between UNIVALI and DEINFRA as a condition imposed by the highway environmental licensing process. After so many years, it was only in late 2007 that an Environmental Education Program (EEP) was put forward as a priority action within this broader program. The EEP also counts with a partnership with the Transdisciplinary Nucleus on

Environment and Development (Universidade Federal de Santa Catarina) on issues related to natural resource management and development.

Today, the delivery of the EEP is a substantial component of the governance system currently in place towards the implementation of the Pirajubaé Marine RESEX. Some of the methodological principles adopted by the EEP are:

- Critical and Emancipatory Environmental Education: the environmental educator must act to 'facilitate' critical thinking by the targeted audience about the socioeconomic and environmental context by which they are affected. Thus, individuals are able to develop self capacity and the means to influence their own destiny as individuals or collectively;

- Facilitation of participative governance processes: facilitation of some meetings and encounters between local stakeholders, when discussing Pirajubaé Marine RESEX governance issues and transferring knowledge between academia and local people;

- Knowledge construction approach: prioritization of methodologies that favor collective construction of knowledge, instead of solely bringing answers to questions and issues emerging in the daily practice and discussions about the governance of Pirajubaé Marine RESEX.

The EEP is planned to be implemented on the mid-long run, recognizing that the socioecological system of the CP is dynamic, complex and largely unpredictable. Thus, instead of planning specific actions over a pre-determined timeline, EEP possible actions lies in three interdependent axis or 'types' of interventions in the local socioecological system.

The **first axis** outlines the need to develop actions that enables the reconstruction and strengthening of a common/shared identity, including the individual and collective recognition of a common/shared cultural and environmental patrimony at the CP.

The **second axis** outlines the need to develop actions that encourages and engages local people in the socioeconomic and environmental research and monitoring of the CP, using indicators that emerges from participatory processes of collective discussion and construction.

The **third axis** outlines the need to develop actions that values and stimulates citizenship, enabling the rise and consolidation of the means and capacity within the community so that people engage in participatory environmental governance and local development.

At all three axes, the LEA-UNIVALI team employs field methods derived from environmental education and participatory fisheries governance. Substantial effort was also dedicated to community mobilization to stimulate peoples' participation in the process of environmental governance currently ongoing at Costeira do Pirajubaé.

5. EFFECTIVENESS

Before all the historical fragilities of Pirajubaé Marine RESEX, we are inclined to believe that marine conservation outcomes generated was minimum in the history of this MPA. The lack of clear objectives and a weak institutional capacity to implement the RESEX enabled substantial changes in the natural and social environment. The impact of the construction of the highway in the socioeconomic and cultural dimensions of the area most certainly undermined a short-term resiliency of the socioecological system, prejudicing the capacity and predisposition of people to collective action towards biodiversity conservation.

Almost no patrolling was ever delivered by the environmental agency in the marine area. When done, patrolling was oriented to avoid housing expansion over mangroves in the terrestrial portion of the Pirajubaé Marine RESEX. We can thus conclude that very limited effectiveness was so far achieved in fulfilling the site's environmental conservation objectives, especially considering the marine area. On the other hand, the existence of a federal protected area implies a larger role of the federal government in regulating and influencing the development of projects in the area.

In the past two years, substantial effort was placed in community mobilization, and now (as in

November/2009) a small group of fishermen are holding frequent meetings and are motivated to push the implementation of the RESEX forward. Therefore, social and cultural impacts are arguably beginning to be addressed.

6. INCENTIVES

6.1 **Economic incentives**

Few economic incentives were implemented at Pirajubaé Marine RESEX apart from the designation of the site (e.g. assignment of property rights). There are several opportunities arising to implement such incentives in the following year, either through actions of the EEP or by the delivery of compensation obligations by DEINFRA.

We expect a fish processing plant and an administrative centre for the Pirajubaé Marine RESEX in the near future, paid by DEINFRA as a legal compensation obligation. The implementation of fish processing plants would be an important incentive for Pirajubaé Marine RESEX governance.

Property rights were designated to a traditional community, but lack of community organization and agreement over the profile of the 'true' beneficiary of the RESEX limits the effectiveness of such assigned rights. Protection from incoming users is key in this study case, but so far has been not effective mainly because of very limited enforcement mechanisms in place (e.g. lack of patrolling by federal government).

Although no incentives were so far designed to deliberatively improve local infrastructure and living standards, this target is provided by the RESEX protected area category. Once established, the DMC will be able to articulate with various partners (Universities, NGOs, government, etc) and pursue better life standards. For instance, there are several government programs in different bodies (e.g. ministry of health, ministry of fisheries, ministry of agrarian development, etc) that favor local people residing within or nearby RESEX.

6.2 **Interpretative incentives**

During the history of Pirajubaé Marine RESEX, a few posters and banners were printed in different occasions, in order to disseminate information about the CBMPA and the local environment. However, it is not possible to evaluate the success of these initiatives in changing attitudes of local people. As mentioned before, there is a wide lack of knowledge about the existence of the Pirajubaé Marine RESEX, its potentialities and attributes. Information signs and panels will be placed in the near future in strategic places around the borders of the site in order to inform neighboring people about the Pirajubaé Marine RESEX ecological and legal attributes.

The EEP supports that every communication strategy, including its content and form, are born out of a collective construction amongst stakeholders.

From May/October 2009, the EEP offered two courses on 'Participatory Environmental Governance' to local people and scientists of UNIVALI. The objective was to enhance understanding about the principles and practices of environmental governance and to enable the practice of knowledge exchange.

6.3 **Knowledge incentives**

Pirajubaé Marine RESEX is probably the Brazilian protected area with the largest body of scientific knowledge available. At least 177 scientific manuscripts are known, the vast majority lying in the fields of natural sciences (ICMBio, 2009a). However, scientific knowledge exists but it is not accessed by local people and generally barely used by the environmental agency as a guide to management. Maybe the only exception was in the fields of mussel ecology (Pezzuto and Echternacht, 1999), where there was a significant scientific knowledge input in decision-making. A recent report by the environmental agency also claims that there was limited exchange/influence between the environmental monitoring program leaded by UNIVALI and the implementation of the highway by DEINFRA (ICMBio, 2009b). In the past two years, the EEP have been struggling to engage scientists (always with busy agendas and research priorities) in devolving their scientific knowledge to local people.

Several methodologies are being applied to document local knowledge on ecological and historical attributes of the Pirajubaé Marine RESEX (e.g. semi-structured interviews, group thematic discussions). In the following months, further studies on local ecological knowledge will subsidize the elaboration and discussion of the Management Plan.

In the past, there were limited spaces and stances for decision-making, including the possibility of sharing knowledge amongst stakeholders. In the past two years, the EEP's work has been to enable a series of encounters amongst fishermen and between fishermen and scientists to stimulate the practice of knowledge sharing (e.g. course on participatory environmental governance). We expect that a working management council will enable a collective learning, knowledge sharing/construction and arbitration platform. Today, in the absence of such council, much of the arbitration still lies with the government authority and ultimately in the Brazilian judiciary system (only in extreme cases).

6.4 **Legal incentives**

Pirajubaé Marine RESEX lies within an arguably consistent national legal basis, thus having clear legal objectives and jurisdictional boundaries. However, lack of a local plan providing clear objectives and norms is still not present to guide management. The only existing official body of norms (primarily regulating mussel exploitation) is not widely acknowledged and legitimate in the opinion of the environmental agency and local stakeholders.

Efforts are therefore being placed in the participatory construction of new norms while the environmental agency pursue within the institution the operational and logistic capacity to patrol and enforce. There are no ongoing monitoring schemes in place, the plan being to build participative agreement upon a series of monitoring indicators (e.g. socioeconomic and biophysical) in the near future.

The way the state has been trying to steer the local governance system is contradictory, bureaucratic and therefore arguably ineffective. The designation of the Pirajubaé Marine RESEX followed by the immediate licensing of such an environmentally and socially harmful enterprise is at the bottom of a series of inconsistent actions in the history of this protected area. At the local level, the officer is also apparently always affected by the lack of a clear, continuous and consistent institutional leadership.

6.5 **Participative incentives**

Historically, there was very modest participation of local people in decision-making. Most past decisions were made by the officer in charge of the RESEX, or in collaboration with few fishermen. Substantial effort has been placed in developing participative incentives in the past two years. As in any RESEX, participation of local people is imperative and a condition to the implementation of all other incentive structures.

However, the following challenges have to be dealt when working towards further participation of local people:

- Limited capacity of the environmental agency to implement a minimum patrolling scheme, inhibits the inclination of people to engage in participatory processes;

- There were historically many unsuccessful attempts to implement Pirajubaé Marine RESEX, so many fishermen do not participate simply because they feel 'nothing ever happens' after meetings;

- Some meetings are very intense with harsh discussions, a factor that inhibits participation;

- Local cultural characteristics are not of a great deal of participation.

Local customary institutions were present in the past, but apparently disappeared due to acculturation and social fragmentation. The designation and implementation of a RESEX also changes the ways by which people interact with each other. Local stakeholders have now to adapt to a new legal system for collective regulation of resource use and socioeconomic development. Furthermore, the bureaucratic logic differ from traditional ways of organization and conflict resolution, which are based in informalities, family and neighborhood relationships. Therefore, participation demands of local people a broad institutional learning.

The EEP is also working towards the establishment and strengthening of relations of trust amongst local stakeholders. Several methodologies of group learning and interaction dynamics are applied, i.e. course on participatory environmental governance described above. The EEP team also plays a neutral facilitation role in many discussions.

Finally, a key incentive being delivered by the EEP is oriented to deal with the reconstruction and strengthening of a community 'identity'. Several encounters and meetings are designed to value both material and immaterial symbolic references of fishermen culture, allowing for a constructive and critical thinking regarding the historical, cultural and environmental patrimony of the community

7. KEY ISSUES

While all incentive categories are relevant, some general conclusions can be drawn in terms of priorities to the governance system at Pirajubaé. Firstly, maintaining and strengthening participative incentives is key for the very existence of the RESEX. Only through active participation of local people is that all other incentives can be collectively discussed and implemented. A RESEX does not exist without the local people.

The limited effectiveness of the RESEX generated 'resentment' in local extractivists and artisanal fishermen (Lobão, 2006). They denounce a public policy that have so far included a few in a subaltern manner, and excluded others that does not fit within the legal concept of traditional population. Dealing with such resentment from both sides is a great challenge to the participatory process.

Economic incentives are also key to stimulate local peoples' engagement in the governance process, as the feeling of disbelief on the RESEX as something meaningful to their lives is still present. Nonetheless, local fishermen deserve serious attention to improve their livelihoods after so many years of injustice.

Legal incentives are important in relation to the local scale of objectives and norms, as the broad scale (national and international) legal provision is well structured.

Interpretative incentives that contribute to people's understanding of the ecological and statutory attributes of the RESEX are very important and could improve stewardship. Most citizens of Florianópolis city do not know about the existence of the RESEX though they may pass through it every day.

Documenting the local ecological knowledge and bringing scientists and local fishermen together are very important knowledge incentives to be pursued. As seen before, this might be the most well scientifically known marine seascape in Brazil, though no communication channels historically exists between scientists and local people. There is a large scope for knowledge construction and sharing exercises.

CROSS CUTTING ISSUES/FACTORS:

1. **Leadership**

Today, current officers in charge of the Pirajubaé Marine RESEX publicly admits the negative approach and decisions historically put forward by IBAMA (today all federal protected areas are under ICMBio administration).

The leading role of the environmental agency (one of facilitating the implementation of the MPA) clearly changed by the end of 2007 with the allocation of a new officer. This new officer had sufficient openness to admit past institutional failures, and started to slowly shape new alliances with key local players. In early 2009, officers changed again, and now a lady with significant past experience in conducting community-based initiatives was given the opportunity to lead the implementation of the Pirajubaé Marine RESEX. Most local stakeholders (including ourselves) acknowledge significant changes and a positive response of the entire governance system as a consequence of the leading role of these officers. They have both publicly assumed past institutional mistakes and adopted a transparent and democratic style of facilitation.

2. **Role of NGOs**

We found no evidence of past influence of environmental NGOs in the history of the Pirajubaé Marine RESEX. There were indeed three community fishermen associations that emerged since 1992 (none of them are currently active).

3. **Equity**

As the primary objective of the RESEX is to direct the flows and benefits of the MPA towards a given traditional community, one would expect that equity issues are naturally resolved. However, at Pirajubaé Marine RESEX, the heterogeneity of fishermen profiles and consequent lack of clear definition of who is the 'traditional community' raise recurrent discussions regarding the merits/roles/responsibilities of different groups within the governance system.

Delegating property rights over an area to a 'traditional' group will most certainly raise conflicts with the 'others', those who do not share the 'traditional' attributes, but have an interest in natural resources. Mediating these conflicts involve collectively reviewing and reconstructing ethnic and social identities. The concept of 'traditional population' is diffuse in Brazilian legislation, and frequently dos not apply to realities present at some RESEX. An important question remains: How to work with those that do not fit this conceptual category?

4. **Stewardship**

The designation of the Pirajubaé Marine RESEX was by itself an incentive for local stewardship. However, a general lack of understanding on what really means being part of an Extractive Reserve prevented people to buy in the idea and actively contribute/participate in the implementation of the site. Other factor stimulating the lack of local stewardship was the contradictory and negative role of the environmental agency in conducting the process, as a series of profound changes in the local socioecological system were allowed to occur.

The Cres-Lošinj Special Marine Reserve
Governance Analysis

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1. CONTEXT

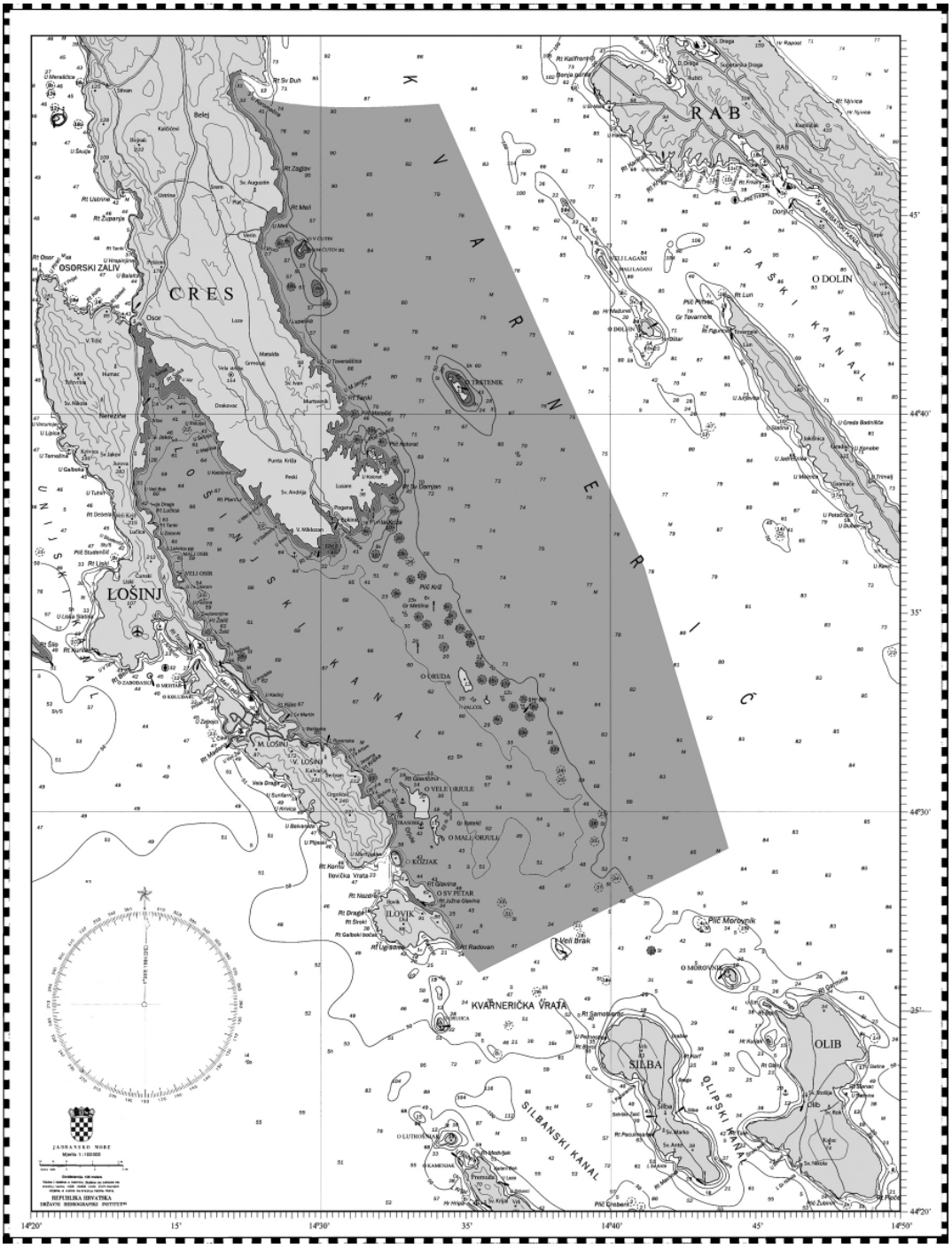
Name: Cres-Lošinj Special Marine Reserve (CLSMR);
Size of MPA (km^2): 525.76 km^2 (islands: 2.40 km^2).
Coastline length (km) (where applicable): 154.548 km
Distance from shore (range, from inner edge to outer edge): 15 km

	National (2008 estimates)	**Lošinj Island** (2007)
Population per km	79.6	37.6
Population growth rate	-0.052%	N/A
Per capita GDP (US$)	16,100 USD	N/A
GDP growth rate	4.8%	N/A
GDP composition by sector	Agriculture: 7% Industry: 31.6% Service: 61.4%	N/A
Labour force by occupation	Agriculture: 5% Industry: 31.3% Service: 63.6%	Agriculture: 0.6% Industry: 9.0% Service: 90.4%
Unemployment rate	14.8%	9.6%
Government type	Presidential - Parliamentary democracy	Executive Mayoral system

The Cres and Lošinj Archipelago lies in the borderland area of the Northern Adriatic an inherently European space (Ballinger, 2004). Originally inhabited by the Ilyrics, subsequently governed by the Romans and colonised by the Croats, and then domination by the regional powers of Venice, Italy and Austria has left a rich local heritage (Fučić, 1990). At its peak in 1844, Mali Lošinj was the second largest producer of ships in the Austrian empire, the development of steel steam ships in the 1880s led to the decline of the shipbuilding industry (Balon et al., 2005). In 1886 health tourism, particularly for respiratory and allergic diseases, started to develop. The defeat of the Axis powers in World War One lead to archipelago being ceded to Italy. The Italians maintained control until the end of the Second World War, then the islands became Croatian as part of the Yugoslav Federal Republic. This lead to mass emigrations of the Italian minority and non-communists; it was not until the development of mass tourism facilities in the late 1960s did the population rise again (Podgorelec, 1999). Immigration of other Slavic peoples in this period changed the demographic balance to what is recognised as the most open population of the Adriatic islands (Lajić, 1993).

Socially, economically and environmentally Lošinj is dominated by tourism. Emigration remains a problem as opportunities stagnate on the island there is a movement of young people to the continent. Although there has been significant development of tourism and tourist facilities the local infrastructure does not have the capacity to maintain the tourist influx in the summer season. Tourism remains concentrated in two to three summer months which exacerbate the feelings of isolation and peripherality of the local population in the winter (Mackelworth, 2007).

The Cres-Lošinj area, also known as the Kvarnerić, (map 1) is one of the healthiest marine areas in the Northern Adriatic Sea. This is mainly due to the presence of a submarine ridge stopping the fluvial sedimentation of the river Po. The marine area encompasses a wide range of marine habitats, including rocky shores, submerged reefs, seagrass flats, and mud seabed. It is particularly diverse with over 95 species of teleost fish, bottlenose dolphins, large sharks and turtles (Island Development Centre (IDC), 1997).



Map 1: The Cres-Lošinj Special Marine Reserve

2. OBJECTIVES

The Cres-Lošinj Special Marine Reserve (CLSMR) is the first area of any major size dedicated for the protection of marine biodiversity in Croatia (map 1.). On the 26th July 2006 the CLSMR was granted three year 'preventive protection' by the Ministry of Culture (Klasa UP/I-612-07/06-33/676, Urbroj 532-08-0201/5-06-1). Preventive protection is a proactive step, under article 26 of the Nature Protection Act Law (2005), to protect an area that is considered as being under immediate threat. In 2006 this area was under immediate threat from the construction of a 380 berth marina in the small village of Nerezine located in the middle of the area.

The definition of a Special Reserve is described under Article 12.1 of the Nature Protection Act (2005) as 'an area of land and/or sea of particular importance for its uniqueness, rarity or representative character, or is a habitat of endangered wild taxon, having a particular scientific significance and intended purpose'. This category is declared by the State, but managed at County level with the option for management to be ceded to the Municipality in which the protected area resides. The CLSMR resides wholly within the Lošinj Municipality allowing for the development of a local management board.

The primary objectives of the CLSMR are:

- The restoration and maintenance of the population of bottlenose dolphins (*Tursiops truncatus*) in the Kvarnerić at a viable level;
- To ensure that the Kvarnerić provides the environmental and ecological processes necessary for the achievement of this primary objective, subject to natural change;
- To provide protection of the habitat of the Loggerhead sea turtle (*Caretta caretta*) for whom this area is a summer habitat for foraging, and a winter hibernation habitat;
- Provide protection of sea grass meadows (*Posidonia oceanica*) as well as coral biocenosis;
- Protect islands and coast that are nesting and brooding sites for protected birds species;
- And, protect underwater archaeological sites (Mackelworth *et al.*, 2002).

International and national objectives

Croatia has signed and ratified all of the major conventions and agreements relevant to marine biodiversity conservation, the most applicable to this site are:

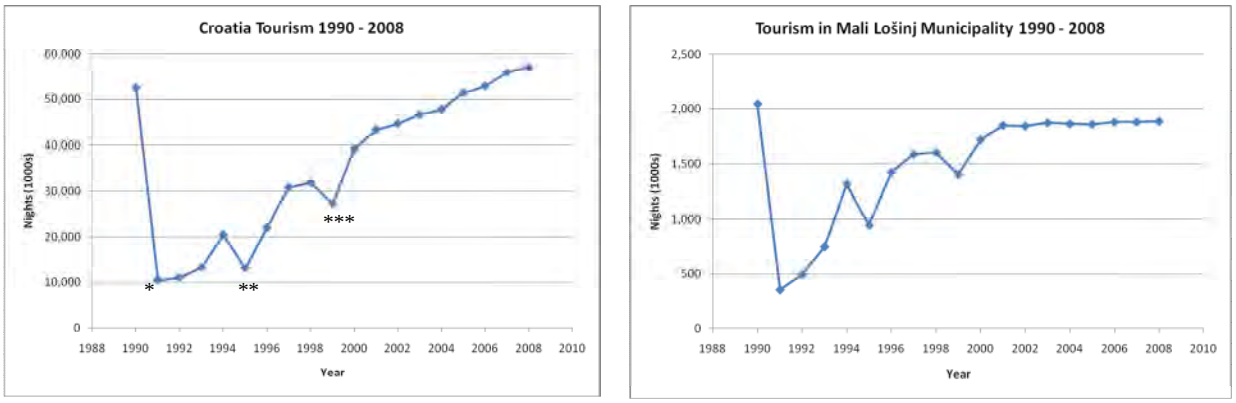
- The Convention on the Conservation of European Wildlife and Natural Habitats (Bern, 1979);
- The Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS) (Monaco, 1996);
- The Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (Barcelona, 1976).

This area is listed as a priority under the ACCOBAMS agreement and included in the Pan European Network of Protected areas under the Bern Convention. Croatia is also an EU accession country hence harmonisation with EU directives is a national priority, in nature conservation the EU Habitats Directive an absolute priority. The MPA has been promoted as one of the future 'Natura2000' sites for the EU Habitats Directive (Council Directive 92/43/EEC) and was recently listed in the Fourth National Report to the Convention on Biological Diversity (2009).

In addition it will fulfil many of the intentions expressed in the National Strategy and Action Plans for the conservation of biodiversity (1999): Development of protected areas for protected species; protected areas for all species of dolphins; Estimation of the size, population trend and protection of dolphins, through the use of a pilot marine park. With ''*Particular emphasis will be placed on the protection of species listed as endangered on a global European or national scale'*.

3. DRIVERS/CONFLICTS

The service industry dominates Croatian GDP and employment; this is directly related to the tourism industry (figure 1). Tourism is the primary economic driver and greatest threat to the islands and coastline. Additional threats are urbanisation and unregulated development, fishery and pollution. Since independence there has been intensification in development pressure on the islands and coastline. Land-use plans have been targeted by speculators to profiteer through the planning system before EU accession (Mackelworth & Carić, 2010). Regarding fishery, there is increasing interest in the pelagic fishery throughout Croatia with the development of a subsidised industrial fleet.



* 1991 Start of Croatian War of Independence, siege of Dubrovnik
** 1995 End of Croatian War of Independence, operation 'Storm'
*** 1999 NATO bombing of neighbouring Federal Republic of Yugoslavia

Figure 1: Tourism in Croatia and the Mali Lošinj Municipality, 1990 – 2008 (Statistical Office, Rijeka)

The CLSMR suffers from the same drivers and conflicts as the rest of the Croatian Adriatic. In Lošinj tourism recovered faster due to the developed tourist infrastructure and lack of direct conflict (figure 2). Yet, only a limited part of the islands is serviced by a sewerage system, wastewater from many of the hotels is biologically untreated and disposed of directly into the sea. The system is adequate for the residents of the archipelago, but in August when the population quadruples the water quality declines (IDC, 1997).

The development of nautical tourism, particularly the use of personal watercraft, has a direct effect on the dolphins. Physical and noise disturbance displaces the dolphins in the summer months when the amount of registered boats on the island also quadruples (Mackelworth *et al*., 2003). In addition there is no estimate of the number of boat transiting the area. Associated with this is the transmission of the invasive algae *Caulerpa taxifolia* and *Caulerpa racemosa* through unmanaged anchoring. In November 2009 a large patch of *C. racemosa* was discovered less than 5 nautical miles from the border of the CLSMR.

Tourism is proposed to grow by 40% within the archipelago by 2015. Associated with this growth will be an increase in the nautical tourism, particularly an expansion of the harbour of Mali Lošinj adjacent to the CLSMR, and the marina in Nerezine. If the Nerezine marina is constructed it is likely to affect the dolphin distribution due to disturbance pressure. It is unknown how this pressure could affect the dolphins at population level or in terms of permanent migration from the area. Yet, the harmonisation of the Croatian law for environmental protection with the EU Directive on Environmental Assessment (Council Directive 85/337/EEC, amended Council Directive 97/11/EC) requires that all new investments should carry out a full Strategic Environmental Assessment as well as satisfy the requirements of the Habitats Directive.

Although fishery accounts for less than 1% of employment on the island, its effect is larger due to the multiple

gears used in the area and the large 'recreational' fishery (IDC, 1997). The area is fished by bottom trawlers, purse seiners, static gill and trammel nets, long-lines, rod and spear gun. In all niches fish are exposed to at least one gear. 'Recreational' fishery is a major impact due to the fact that many of the seasonal tourist workers supplement their income outside the summer season by fishing. External fishers, including professional purse seiners and bottom trawlers use the area; in addition purse seiner vessels have been implicated in the illegal use of explosives. There is a general trend of decline both in the index of fish biomass of total catch and catch of the commercial species and in the area. The opening of the external EU market has recently led to many of the fish from the Lošinj region being exported to Italy exacerbating the problem.

The migration of people from the island has led to the loss of local ecological knowledge. It also makes it difficult to identify a defined indigenous population to work with to develop long-term sustainable development strategies. Yet, although this is considered the most open population of any of the Croatian islands the role of influential individuals dominates the participatory process (Mackelworth & Carić, 2010). For institutions seeking to fulfil statutory requirements for participation it is easier to access these individuals rather than seek true participation.

4. GOVERNANCE FRAMEWORK/APPROACH

National Level	National Government Governmental decision on the justification of the area must be made for permanent protection	Ministry of Culture The competent authority for nature protection	State Institute for Nature Protection Advisory body to the Ministry of Culture for nature protection. Supervisor overseeing the work of the county institutions
County Level	Public Institution for Managing Protected Nature Areas of the county of Primorsko-Goranska The legally responsible institution for the development of a management plan and internal rules for the area. The Institution also has the power to approve or prevent any activities that are seen as a potential threat to the area.		

The permanent designation of a Special Reserve is declared by the National Government, on the recommendation of the competent authority, the Ministry of Culture. The management authority is appointed to the County within which the protected area resides. However this designation type provides for the local Municipal authorities to request management authority, which would then be ceded by the County authorities.

Temporary preventive protection is granted by the Ministry of Culture as a solution to protect an area under direct threat. It lasts for a maximum 3 year period within which time a final proposal for the protection should be drawn up by the Ministry of Culture and submitted to the Government for approval, this should include the internal bylaws of the area. Within this 3 year period no new use of an area is permitted, however, the ongoing use, provided it does not the protection of the area, can continue (Maričević, 2006). The deadline for permanent protection of the CLSMR expired on the 26th of July 2009. As yet there has been no internal rules or zones defined, and no true participative input been sought.

It is believed that changes to the designation are in progress including: changes to the borders to limit its effect of protection on the economy of the island; and, the area will be downgraded from 'Special Reserve' to 'Regional Park' (Fabrio Čubrić et al., 2009). If this is indeed the case this will open up questions over the validity of the area to satisfy biological objectives and the requirements of the international agreements and conventions, and particularly the Habitats Directive.

5. EFFECTIVENESS

Although the CLSMR can only be regarded as a 'paper park' with no management, no budget and no enforcement, preventive protection has been effective in deterring the threat of the construction of the Nerezine marina to date. Preventive protection has also focussed the attention of the authorities and stakeholders to the fact that some form of management is required, regardless of the designation type.

Impacts addressed	Impacts not addressed
• Development of the Nerezine Marina • Discretionary code of conduct around dolphin groups • Use of explosives in fishing activities	• General personal watercraft behaviour • Illegal fishing practices • Aggressive 'dolphin watching' tour boat behaviour • The spread of invasive algal species • Land-based pollution

Fish stocks are believed to be in decline, however there has been no fishery assessment undertaken within the MPA, the development of preventive protection has opened the debate on the development of 'micro-zones' for management of local fish stocks in spawning season.

General disturbance and boat traffic remains an issue in the area; however a widely published code of conduct has reduced negative interactions between personal watercraft and dolphin groups.

Interest into the interactions between fisheries and dolphins led directly to the investigation of fishing practices utilising explosives.

6. INCENTIVES

6.1 Economic incentives

- 'Lošinj the island of dolphins'

The CLSMR proposal was linked to the development of tourism on the island. Branding Lošinj as 'the island of dolphins' was used to define the island within the Croatian tourist offer. This concept was developed with the previous local administration which supported the CLSMR. Since the change in local administration the island image has moved more towards health tourism with a rebranding as 'the island of vitality'.

- Local protectionism

There was an attempt to promote the concept of local protectionism and marketing fish as being 'sustainably' fished from the CLSMR. These ideas were never adopted due to objections raised from adjacent islands and the national fishery guild, and the absence of a coherent Lošinj fishery guild. The leaders of the Lošinj fishery guild later opposed the MPA in cooperation with the developers of the marina in Nerezine.

- Promoting alternative livelihoods

Many day trip operators promote their trips using the dolphin image and the 'dolphin watching' concept. Additionally, some bottom trawlers provide tourist day trips combined with the 'trawling' experience in the summer seasons.

- External funding

The position of Croatia as an EU accession country provides the opportunity to apply for funding for the development of infrastructure, management plans and personnel for the protected area. In addition funding from the World Bank and various UN agencies has been forthcoming into the State and would be possible sources of funding.

Linking the development of the CLSMR with economic capital is essential, particularly in a country where transition to a market economy is still ongoing, such as Croatia. However, there is the fear that the tourist industry would further dominate and corruption at all levels will undermine the process. Economic incentives are the second most important in this case study.

6.2 Interpretative incentives

- The Lošinj Marine Education Centre

The centre, developed in cooperation with the previous local administration, has provided a local focus for sustainable development and extra-curricular environmental activities on the island. The centre is a tourist attraction in the summer, and attracts schools and colleges in the shoulder season which benefits the local economy. The development of educational programmes has also been used to keep young students interested in the island to stem emigration.

- Media

Media was particularly helpful in promoting the concept of the CLSMR as the first MPA for dolphins in the Mediterranean. Media pressure directly supported the implementation of preventive protection to stop the development of Nerezine marina. However, as conflicts emerged some media also sought to exacerbate problems by publishing inflammatory stories.

- Publications

A series of brochures have been published highlighting the advantages of the protected area for local management and economy.

Communication of science and policy to stakeholders in an understandable manner increases transparency. The media was a double edged sword with mainly short-term influence. The combination of the educational centre as an interpretive resource, but also benefiting the local economy, is important and a long-term tangible asset.

6.3 Knowledge incentives

- Scientific information

The nature of cetaceans and their mobility make uncertainty inherent when trying to define population home-range or critical habitats. This allowed for the promotion of alternative misinformation regarding the population. In addition the absence of information on marine habitats and fish stocks within the area also increase uncertainty.

- Local knowledge

Attempts were made to access local ecological knowledge, however the lack of a definable indigenous population resulted in little information could be integrated into the process. Efforts were made to include stakeholders in research and develop research programmes in cooperation with the fishing guild, however this ceased at the designation of preventive protection.

One of the fundamental issues has been the origin of 'scientific' information. In Croatia, institutional position remains a more important verification of competence than publication and international recognition, regardless of the fact that it is widely known that the institutional scientific community is rife with nepotism, favouritism and corruption.

6.4 Legal incentives

- International requirements

Without ACCOBAMS and the overarching national policy to harmonise with EU law there would be little national interest in developing the CLSMR. At international level, the EU whilst accession negotiations are ongoing, ACCOBAMS and other agreement and convention secretariats will need to maintain pressure on the Croatian government for successful implementation of the CLSMR.

- National law clarity and political will

Since Croatian independence the law for nature protection has been re-written three times and the competent authority for protected areas changed from the Ministry of the Environment to the Ministry of Culture. Additionally the Croatian law for Nature Protection lacks definition and is open to interpretation, and as yet has not been tested by the rule of law to provide precedence. In addition the State Authorities lack the political will to promote conservation strategies over development.

- Coordination between authorities.

Communication between the SINP, the Ministry of Culture, and the County Public Institution for Managing Protected Nature Areas appears to be limited. Each office is coordinated by an elected official usually sponsored by a political party. Often officials are from differing parties, hence fiefdoms are developed at different institutional levels and there is a politicisation of conservation strategies. The major problem remains that absence of a competent authority to lead the process.

Until clear leadership is defined then the CLSMR will continue to confuse and confound local users. Associated with this is the absence of any clear bylaws. Without clear interpretation of the law by the competent authorities it is open to manipulation and misinformation, with opponents to the MPA willing to utilise this confusion. This is the most important incentive to get right.

6.5 Participative incentives

- Local negotiations

Initial good cooperation between local NGOs, stakeholders and the SINP helped move the CLSMR proposal to the point of the declaration of preventive protection in 2006. The manner, in which preventive protection was declared by the Ministry of Culture, without prior warning or consultation, eroded the previously developed trust and allowed for the creation of misinformation and tension at local level.

- Special Zoological Reserve

This designation type allows for the development of a local management board; however there was no local political will to take this option. The proposed change to a regional park may undermine the biological objectives without addressing the local concerns over management and participation.

- Gatekeepers

Participation has been highly selective with the State authorities seeking opinions only from highly vocal stakeholders such as the fishery and the boat operator’s guilds, largely opposing conservation. The most recent strategic stakeholder interviews undertaken by the SINP concentrated upon those stakeholders opposing the CLSMR and did not seek balanced views of the island. In addition many local stakeholder groups are fragmented and have been manipulated by the hidden interests of individuals acting as their representatives. Local NGOs have sought to facilitate wider participation, but this has been undermined at local and national institutional levels, and general community apathy.

Participation is a relatively new concept in Croatia it is difficult to create true opportunities for effective citizen participation where there is little or no experience with these processes by the citizens themselves or the institutions that should be facilitating participation.

6.6 Cross-cutting Issues

- Leadership

The absence of clear leadership at individual level, and over the competent authority, has undermined the development of the CLSMR. Loss of local support, through the change in local Mayor in 2005, was also a significant setback. The inactivity of the competent authority after the declaration of preventive protection undermined any trust that had previously been created; hence the greatest effect of this issue is on the legal and participative incentives.

- Role of NGOs

NGOs have played a significant role in all the incentives. In particular they provided the principal source of scientific knowledge, play a major role in the interpretative incentives through the Lošinj Marine Education Centre, and lobby at international level. Initially, NGOs also pushed for participation, but due to the disinterest of the State have reduced this role.

- Equity

Participation in Croatia remains in its formative stage. Generally participative approaches concentrate on 'the usual suspects' there has been little attempt by the authorities to do little more than minimum consultation. Additionally, consultation has concentrated on attempting to placate the opposing stakeholders, at the expense of the biological objectives, rather than seeking widespread consensus.

- Stewardship

Due to the demographic changes to the archipelago it is hard to identify a defined indigenous or local 'community'. Transience and seasonalism make it difficult to create critical mass for the development of collective action to lead to the stewardship of the island as a whole.

7. KEY ISSUES

The legal incentives are the most important aspect of the development of the CLSMR. EU accession and the need for the harmonisation with the Habitats Directive in particular is an overarching factor. Countering this, the increasing articulation with the EU market is placing greater stress on the marine environment of Croatia as a whole. Transition of the Croatian economy is ongoing and hence the economic aspect of conservation has to be a feature for the CLSMR if it is to be successful, again this is related to the possibility of finding EU or external funding. The absence of clear leadership and ambiguity over the competent authority, partially related the designation type, will need to be clarified for the CLSMR to be effective, however the absence of political will at all levels makes this unlikely. Finally, the defining issue has been the direct conflict between the development of the marina in Nerezine and the CLSMR. This was the catalyst for the development of opposition to the protected area concept, without the marina conflict over the protected area would be significantly less.

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