

A sunset over the ocean with silhouettes of people in a boat. The sun is low on the horizon, creating a golden glow over the water and sky. In the foreground, several people are sitting in a boat, their forms silhouetted against the bright light. The background shows a large, dark landmass under the setting sun.

Emergency Oceans Rescue Plan:

Implementing the Marine Reserves
Roadmap to Recovery

GREENPEACE

image Fishing trawler *Jin Hui No.3* hauls in its nets against a sunrise, Pacific Ocean.

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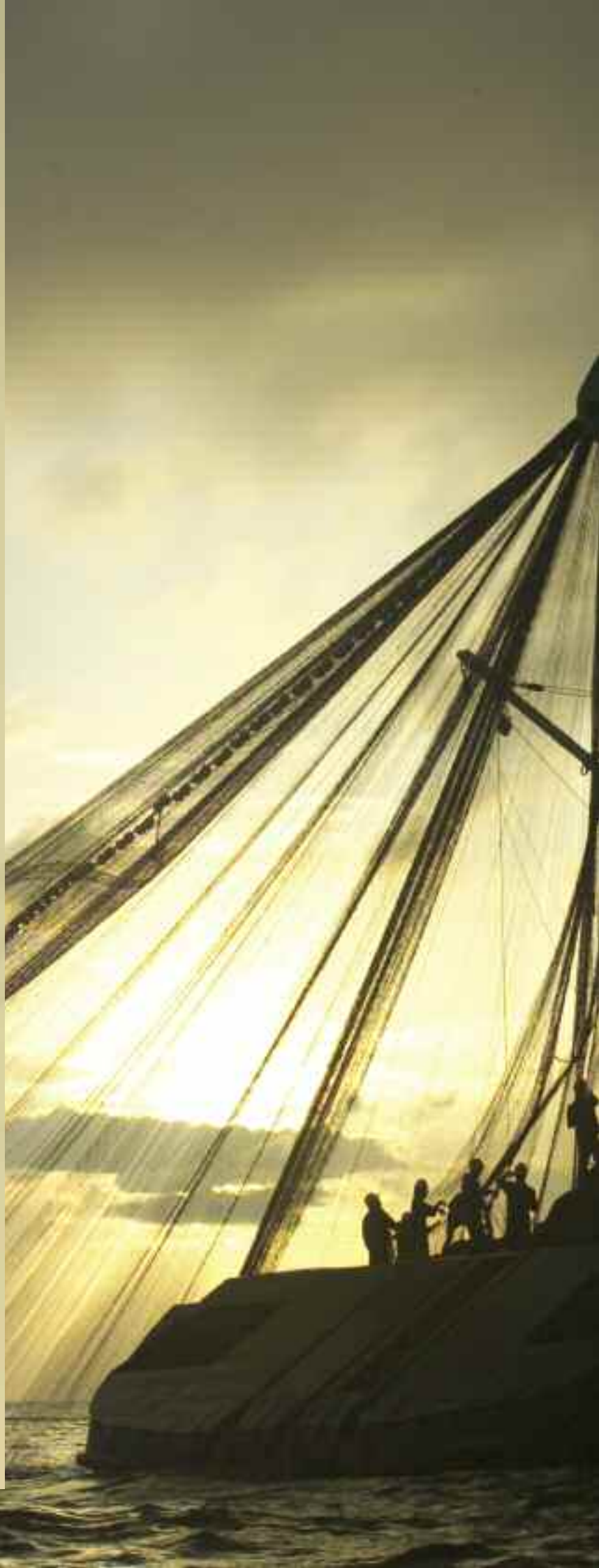
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PHOTOGRAPH ON PAGE 44
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‘Human activity is causing the diversity of life on Earth to be lost at a greatly accelerated rate. These losses are irreversible, impoverish us all and damage the life support systems we rely on every day. Let’s reflect on our achievements to safeguard biodiversity and focus on the urgency of our challenge for the future.’¹

Foreword

01

Our oceans are in crisis. Hardly a week goes by without another major study linking the loss of marine biodiversity with human activity. Scientists repeatedly warn that many ocean ecosystems are fast approaching tipping points whereby they will be changed for ever. There is a growing realisation that the wholesale degradation of our seas and oceans is likely to have a profound impact on us all as vital services provided by ocean ecosystems are disrupted, threatening food security and the very survival of millions of people.

However, there is hope. Evidence garnered from all around the globe shows that the creation of marine reserves – areas of ocean set aside as off-limits to fishing, fossil fuel extraction and other industrial activities – can protect and restore ocean ecosystems. Furthermore, by creating networks of marine reserves and implementing sustainable management in the surrounding waters, not only can we conserve marine species and habitats but also ensure fish for the future.

Unfortunately time is not on our side. A sense of urgency needs to be instilled in our politicians and decision-makers. Although there have been some positive developments over the last few years with the creation of a number of large-scale marine reserves such as the South Orkneys marine protected area in the Southern Ocean, the Chagos protected area in the Indian Ocean and the Marianas Trench Marine National Monument in the Pacific, progress is pitifully slow, especially on the high seas. At the time of writing less than 1% of the world's ocean is fully protected.

Even if world leaders are aware of the problem and indeed are bound by a number of international agreements to take action, the political will is not there. *Emergency Oceans Rescue Plan: Implementing the Marine Reserves Roadmap to Recovery* sets out what Greenpeace believes needs to be done to establish a global network of marine reserves and reverse the destruction of our oceans. We have witnessed, documented and taken action against the threats to our oceans on both the high seas and in national waters, but we cannot do this alone. The first step for world leaders is to honour existing international commitments and start implementing the measures that will set our oceans on the road to recovery. The year 2010, the UN International Year of Biodiversity, is the perfect time to do so.



Kumi Naidoo
Greenpeace International
Executive Director





Introduction – A critical moment for our oceans

02

In 2006 Greenpeace published *Roadmap to Recovery: a global network of marine reserves*, which presented a design for a global network of marine reserves on the high seas.²

The report focused on the international waters of the high seas in order to present a vision of what a marine reserve network might look like on a global scale and as proof of concept – the methodology and principles being equally applicable at other scales and for coastal waters. It was also a call to ensure the conservation of a large portion of our oceans, our global commons, which lie beyond the limits of national jurisdictions and are therefore the shared responsibility of the entire international community.

The groundbreaking proposal, developed by renowned marine scientist Callum Roberts and his team at York University in the UK, used existing data to demonstrate that there was already sufficient information available to design an effective network of marine reserves, which was a subject for debate at the time.

This report aims to update and expand on *Roadmap to Recovery*, focusing on some priority areas both on the high seas and national waters within country exclusive economic zones (EEZs) where immediate action should be taken, and outline the practical steps needed to establish fully protected marine reserves across the world's oceans. It also highlights the little progress made so far and the urgent need for the international community to prioritise marine conservation in order to ensure the very survival of our oceans as we know them today and to secure the future of the goods and services they provide to humankind.

image Southern bluefin tuna on sale at market in Japan.



© GREENPEACE / LLOYD

image A turtle caught in a fishnet trap. Greenpeace is calling for the creation of marine reserves in the Mediterranean Sea as part of a global network covering 40% of our seas and oceans.



© GREENPEACE / MARCO CAFFE

image Transfer of whales and the flensing of whales aboard the deck of the *Nisshin Maru* factory ship of the whaling fleet of Japan.



© GREENPEACE / JEREMY SUTTON-HIBBERT



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© GREENPEACE / HOFFORD

image Yellowfin and bigeye tuna stocks in the Central and Western Pacific are destined to be critically overfished within three years if fishing of the species continues at the current relentless rates.

image A swordfish caught as bycatch on the end of a bait line of a Korean longliner, the *'Shin Yung 51'*. Many types of billfish, such as this swordfish, sharks, turtles, dolphins and albatrosses can often end up as unfortunate bycatch of longline fishing for tuna.

Marine reserves – The current state for play

03

Over the last decade marine protected areas, and marine reserves in particular, have achieved increased recognition as one of the most effective tools to reverse the global decline in our oceans health and marine biodiversity and implement key modern principles such as the ecosystem approach and the precautionary principle. This has been translated into commitments to implement area based management measures and, in particular, to establish networks of marine protected areas, agreed by States Parties to a number of conventions and agreements.

In 2004, echoing pledges taken at the 2002 World Summit on Sustainable Development,³ the members of the Convention of Biological Diversity (CBD) committed themselves at the CBD's 7th Conference of the Parties (COP 7) to the establishment of a global network of marine protected areas by 2012.⁴ Importantly, the CBD's Programme of Work agreed at COP 7 is explicit in stating that within the integrated network of marine and coastal protected areas there should be '*areas where **extractive uses are excluded** [emphasis added], and other significant human pressures are removed or minimised, to enable the integrity, structure and functioning of ecosystems to be maintained or recovered.*'⁵ Furthermore Decision VII/30 set a target of having '*at least 10% of each of the world's ecological regions effectively conserved*' and protecting '*areas of particular importance to biodiversity*'.⁶

The United Nations Millennium Development Goals, set in 2005, were more ambitious, suggesting that '*having in place a network of representative, fully protected marine reserves that covers 10% of the oceans, with a long-term goal of 30%, is consistent with the 2012 target of the World Summit on Sustainable Development and more aggressive than the proposed Convention on Biological Diversity target on protection of marine areas. Achieving this target requires increasing coordination and coverage of protected areas.*'⁷

Discussions followed about whether the scientific information needed to achieve the above-mentioned commitments to establish a network of marine protected areas was available. Greenpeace's *Roadmap to Recovery* was published during the 8th Conference of the Parties of the Convention on Biological Diversity (CBD COP8) in 2006 in Curitiba, Brazil, to inform those discussions. *Roadmap to Recovery* effectively demonstrated that the excuse that there was insufficient information about the high seas to identify potential protected areas was bogus. The proposal therefore challenged member countries to honour the international commitments they had already made at the CBD two years earlier.

In the four years since the publication of *Roadmap to Recovery* some progress with respect to the creation of a network of marine reserves has been made both within and outside the CBD. One major step has been the adoption by the CBD at its ninth meeting in 2008 of scientific criteria for identifying ecologically or

image Fishing trawler Yu Wen 101 hauls in its nets with crewman in tender in foreground, Pacific Ocean.



© GREENPEACE / ROGER GRACE

image Discarded fish on deck of North Sea trawler. They will be thrown back into the sea because they are unwanted species or too small to meet EC regulations or to be sold for a good price.



© GREENPEACE / JULIAN GERMAIN

image Several species of albatross feeding on orange roughly heads and bycatch behind the Belize-registered deep sea trawler 'Chang Xing' in international waters in the Tasman Sea.



© GREENPEACE / GRACE

biologically significant marine areas in need of protection (Decision XI/20 Annex I) and also the scientific guidance for designing representative networks of marine protected areas (Decision XI/20 Annex II).^{8,*} These criteria and guidance are virtually identical to those used by Professor Roberts and his team for developing the Greenpeace proposal.[†]

But unless the criteria are actually applied and areas identified, there is no chance of the world's governments meeting the 2012 targets for marine protection that they have set themselves and arresting the ongoing destruction of our oceans. The CBD's own *Global Biodiversity Outlook 3* is equally urgent about the failure of the world's governments to meet the target set in 2002 to 'achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on Earth',⁹ while the CBD's scientific body 'takes note of the progress made in the implementation of the elaborated programme of work on marine and coastal biological diversity [...] but notes with concern that these efforts have not been able to prevent the serious decline in marine and coastal biodiversity and ecosystem services [emphasis added].'¹⁰ Examples of how these criteria and guidance might be applied in practice have already been elaborated by the CBD.¹¹

Since fishing is one of the main threats to marine biodiversity, the closure of areas to fishing by Regional Fisheries Management Organisations (RFMOs) can play an important role in saving our oceans. Some of them are slowly starting to implement area closures, particularly to give effect to UN General Assembly

Resolution 61/105 calling on States to ensure the protection of vulnerable marine ecosystems threatened by bottom trawling and other fishing activities.¹² Again, the extent of such closures is clearly insufficient. A recent review conducted jointly by the International Programme on the State of the Ocean and the Deep Sea Conservation Coalition concludes that although most RFMOs have adopted some form of spatial closures 'some have not closed all areas despite strong evidence of the presence of vulnerable marine ecosystems (VMEs) (e.g. NEAFC) and some have closed very few areas despite evidence of wide-ranging destruction of VMEs by bottom fishing'.¹³ RFMOs have important limitations in making the global conservation agenda progress, particularly derived of the fact that they are strongly dominated by fishing interests. Additionally, RFMOs can only regulate fishing and therefore areas closed by those organisations can still be open to other potential destructive activities such as drilling or mining.

* The CBD criteria for the selection of areas are as follows: uniqueness and rarity; special importance for the life history stages of species; importance for threatened, endangered or declining species and/or habitats; vulnerability, fragility, sensitivity, or slow recovery; biological productivity; biological diversity; and naturalness. The properties and components to make an effective network given in the CBD guidance are: ecologically and biologically significant areas; representativity; connectivity, replicated ecological features; and adequate viable sites.

† Actually time has shown that the criteria to be applied are not a contentious issue either. As the CBD SBSTTA noted at its last meeting in May 2010: 'There are no inherent incompatibilities between the various sets of criteria that have been applied nationally and by various United Nations organisations (e.g. FAO, the International Maritime Organisation, the International Seabed Authority) and NGOs (e.g. BirdLife International and Conservation International). Consequently, most of the scientific and technical lessons learned about application of the various sets of criteria can be generalised. Moreover, some of the sets of criteria can act in complementary ways, because unlike the CBD EBSA criteria (annex I to decision IX/20), some of the criteria applied by other United Nations agencies include considerations of vulnerability to specific activities.' Recommendation XIV/3 adopted by the Subsidiary Body on Scientific, Technical and Technological Advice at its 14th meeting. <http://www.cbd.int/doc/meetings/cop/cop-10/official/cop-10-03-en.doc>.

Why we need to act – Ocean ecosystems at their tipping point

04

The establishment of a network of large-scale marine reserves is not an academic exercise, but must to be seen in the context of the worsening ocean crisis. A number of important studies recently published underscore the need for urgent action.

The CBD's *Global Biodiversity Outlook 3* points out that most future scenarios project continuing high levels of extinctions and loss of habitats throughout this century, with associated decline of some ecosystem services important to human well-being. 'The risk emerging for a sixth mass extinction event in the history of life on Earth' is highlighted.¹⁴

Overfishing is identified as one of the primary drivers leading to severe damage of ocean ecosystems, the collapse of fish populations and the failure of vital fisheries. The report is also clear about the need to protect ecosystem services and that cumulative pressures are edging many ecosystems on both land and sea towards certain thresholds or tipping points which if reached will lead to massive biodiversity loss. In the oceans, the vulnerability of the world's tropical coral reefs is highlighted, with climate change, ocean acidification, overfishing, sediment deposition and other human-induced impacts all taking their toll. It should be noted that the changes we see happening to the oceans are going to impact the poor soonest and hardest, but ultimately all societies and communities will suffer the consequences.

Rising levels of CO₂ are already leading to changes in our oceans and many of the changes are likely to be highly complex, including shifts in sea temperature, sea level and currents, and changes to the very chemistry of sea water itself. A recent report released by IUCN (International Union for the Conservation of Nature) in Copenhagen shows that ocean acidification threatens massive extinction of species, food insecurity and serious damage to the world economy. Ocean acidity has increased by 30% since the beginning of the Industrial Revolution and the rate of acidification will accelerate in the coming years. This rate of change is many times faster than anything previously experienced over the last 55 million years.¹⁵

Ocean acidification affects the growth and viability of a range of marine organisms, including corals, bivalves, crustaceans and plankton. Acidification has an impact on all marine calcifying species, including certain plankton groups, clams, snails, and corals. Profound changes to the food web could result. By 2100 it has been predicted that 70% of cold-water corals, key refuges and feeding grounds for commercial fish species, will be exposed to corrosive waters, noting that it is predicted that 10% of the surface waters of the highly productive Arctic Ocean will become under-saturated with respect to essential carbonate minerals by the year 2032, and the Southern Ocean will begin to become under saturated with respect to essential carbonate minerals by 2050, with potential disruptions to large components of the marine food web.¹⁶



Climate change will have numerous effects on biodiversity in the high seas. Climate change impacts are already leading to shifts in species distribution and abundance, including those of some commercially important fish species. The spread of diseases, parasites, and invasive species may increase. Major mortality could be caused by increases in the occurrence of hypoxic zones – areas low in oxygen. Effects on the food supply and on reproduction of cetaceans are likely. For sharks, effects are likely to be indirect through prey and habitat.

Microorganisms, including plankton, bacteria and viruses, account for up to 90% of living biomass in the sea. Plankton uses solar energy to drive the nutrient cycles that make the planet habitable for larger organisms. Temperature increases and fresh

water inputs from melting glaciers – due to climate change – can lead to stratification, or changes in vertical mixing. This can separate phytoplankton from their nutrients, thus affecting primary production. A decrease in upwelling frequency or intensity could result in decreased productivity. In combination with other anthropogenic stressors such as fishing pressure, these effects will be exacerbated and are likely to have profound and unpredictable impacts on marine ecosystems.

Following decades of overfishing and pollution, rapid climate change and increasing ocean acidification mean that protecting marine ecosystems and building their resilience is more important than ever before in human history.

"Current trends are bringing us closer to a number of potential tipping points that would catastrophically reduce the capacity of ecosystems to provide these essential services. The poor, who tend to be most immediately dependent on them, would suffer first and most severely. At stake are the principal objectives outlined in the Millennium Development Goals: food security, poverty eradication and a healthier population."

- Ban Ki-moon, Secretary-General of the United Nations

The cost of not acting

05

The scale and extent of the impacts described above speak for themselves in terms of the costs derived from delaying in taking the necessary action to avoid further erosion of the integrity and functioning of marine ecosystems.

Some authors and international organisations have already tried to estimate the economic consequences of human impacts on the oceans and the results are staggering. The 2009 report by the *Economics of Ecosystems and Biodiversity Initiative* (TEEB) made explicit the economic value of ecosystems and biodiversity and called on policy makers to accelerate, scale-up and embed investments in the management and restoration of ecosystems.¹⁷ Globally the value of ecosystem services can be measured in trillions of dollars. Saving and restoring fisheries was one of the four strategic priorities identified in the report.

The TEEB report draws on a 2008 study, jointly published by The World Bank and the UN Food and Agricultural Organisation (FAO), which exposed the scale of the problem with respect to fisheries and, in particular, the damage caused by fishing subsidies and over-capacity.¹⁸ What the *Sunken Billions* study showed is that the difference between the potential and actual net economic benefits from marine fisheries is in the order of \$50 billion US dollars a year – a sum equivalent to more than half the value of the global seafood trade. The cumulative economic loss to the global economy over the last three decades was estimated by the report's authors to be in the order of two trillion dollars. The key

to recapturing a substantial proportion of this \$50 billion annual economic loss, the study concluded, is improved governance.

In 2004 a team of UK-based researchers conducted a survey of the running costs of 83 marine protected areas (MPAs) worldwide, ranging in size from 100 sq m to 300,000 sq km, in order to estimate the annual running costs of a global network of marine areas covering 30% of the world's oceans.¹⁹ Their estimate came to between \$12 billion and \$14 billion US dollars a year. This amount is not actually so big when one considers the fact that Americans and Europeans spend \$31 billion on ice cream, for example, every year.²⁰ Investing in marine reserves makes absolute economic sense in the context of the scale of the costs incurred by continuing business as usual.

A subsequent assessment conducted by a team based at the Fisheries Centre, University of Columbia, looked at the economic impact of potentially protecting a portion of the high seas in no-take marine reserves.²¹ Their work suggests that such closures would result in relatively little loss in profits to the fishing industry. For example, closing 20% of the high seas may only lead to the loss of 1.8% of the current global fisheries catch in the short term and a decrease in profits to the high seas fleet of about \$270 million US dollars a year. This being the case, the international community could secure significant protection for the high and deep seas and accrue many other benefits for very little cost.



Role of marine reserves in reducing poverty and increasing food security

06

While protection of marine ecosystems is vital for conservation reasons, we ignore the role of healthy ocean ecosystems in ensuring food security and reducing poverty at our peril.

For example, fish make a direct vital contribution to the food security of 200 million Africans – close to a third of the continent's population of about 680 million. Fishing, processing and trading also provide an income for over 10 million sub-Saharan Africans, mostly small-scale fishers, farmers and entrepreneurs,²² of whom 7 million are in West and Central Africa.²³ While data is often scarce, there is enough evidence to suggest that West African fish stocks have been declining since the early 1990s, with reduced catches despite increased fishing pressure.²⁴ The decline in fisheries resources inevitably has socio-economic consequences, from malnutrition to the social problems that arise with the loss of employment. One study in Ghana found that hunting for bushmeat increased proportionately with the decline in fish supply, showing that the ecological effects of overfishing included knock-on consequences for land animals.²⁵ Protecting the marine environment is therefore not a luxury, but is essential to maintaining the livelihoods of coastal populations and alleviating poverty.

The good news is that setting aside areas as MPAs and marine reserves has been shown to help alleviate poverty for a number of impoverished coastal communities around the world. A groundbreaking study, conducted by an economist and an independent social scientist in four separate locations around the Pacific, found that establishing MPAs can lead to improved fish catches, new jobs (mainly in tourism), stronger local governance, benefits to health and benefits to women.²⁶

An acknowledgement of the clear linkage between biodiversity protection and poverty reduction was made when the CBD target 'to achieve by 2010 a significant reduction of the current rate of biodiversity loss' was incorporated into the millennium development goals (MDGs) in 2002. A recent paper written to inform this year's five year review of progress towards reaching the MDGs warns that 'any near-term gains in reducing extreme poverty will be maintained only if environmental sustainability is also achieved'.²⁷



The case for a network of large-scale marine reserves

7.1. Marine reserves: a powerful and versatile tool for both conservation and fisheries management

Marine reserves are highly protected areas that are off-limits to all extractive and destructive uses, including fishing, and – put simply – are the marine equivalent of national parks on land. Wherever marine reserves have been implemented around the world they have been found to confer a range of conservation benefits and, in many places, benefits to fisheries as well.

The establishment of marine reserves has been shown to result in long-lasting and often rapid increases in the abundance, diversity and productivity of marine organisms. These benefits are well summarised in the scientific consensus statement on marine reserves and marine protected areas released at the 2001 meeting of the American Association for the Advancement of Science.²⁸ This statement identified a number of ecological effects both inside the reserve boundaries and external to them.

The beneficial effects can be restated as follows:

1) Within reserve boundaries

- a) Long lasting and rapid increases in abundance, diversity and productivity of organisms attributable to decreases in mortality, habitat destruction and to indirect ecosystem effects.
- b) Reduced probability of extinction of marine species.

It has been noted that in general increasing marine reserve size confers increasing benefits, but even small reserves are effective. To achieve a full range of benefits, full protection with stakeholder involvement and enforcement are required. Other kinds of MPA confer lesser benefits.

2) Outside reserve boundaries

- a) The size and abundance of exploited species increase in areas adjacent to reserves, although this finding is based on relatively few studies.
- b) Increasing evidence that marine reserves replenish populations regionally through larval export.

3) Effects of reserve networks

a) Increasing evidence shows that networks of reserves are more effective than a single reserve at buffering environmental variability and that they provide greater protection for marine communities.

b) Effective networks must span large geographic distances and encompass a substantial area to protect against catastrophic events and provide a stable ecological 'platform' for long-term persistence of marine communities.

The statement goes on to make it clear that in order to be most effective in a joint role of conserving both fisheries and biodiversity, marine reserves must encompass the full diversity of marine habitats, and be operated in the context of complementary management tools and a monitoring programme to define their effectiveness. It concludes that existing scientific information supports the immediate application of fully protected marine reserves as a central management tool for marine systems.

7.2. The effectiveness of marine reserves

A 2009 review of the most up-to-date information relating to marine reserves by the Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) bolstered the evidence in support of the establishment of marine reserves.²⁹ The study revealed that fishes, invertebrates and seaweeds had the following average increases inside marine reserves:

- Biomass, or the mass of animals and plants, increased an average of 446%.
- Density, or the number of plants or animals in a given area, increased an average of 166%.
- Body size of animals increased an average of 28%.
- Species density, or the number of species, increased an average of 21% in the sample area.

These increases were similar between tropical and temperate reserves, indicating that marine reserves can be effective regardless of latitude.

7.3. The case for large-scale marine reserves

In order to be effective networks of marine reserves need to be of sufficient scale. One review looking at the question of how much of the oceans should be protected found that the majority of nearly 40 studies concluded that between 20% and 50% of the oceans should be protected to achieve the conservation of viable populations, support fisheries management, secure ecosystem functions and assure sufficient connectivity between marine reserves in networks.³⁰ Consistent with science, Greenpeace is campaigning for 40% of the world's oceans to be set aside in a global network of marine reserves. The original high seas network proposal in *Roadmap to Recovery* covers some 40.8% of the high seas.

In 2004, Australia's Great Barrier Reef marine park authority introduced a new zoning plan aimed at protecting the entire range of biodiversity on the reef found in the park which in total is about the same size as Japan. Overall more than 33% of the Great Barrier Reef Marine Park is now in no-take areas where all fishing and collecting is prohibited.³¹

The value of large-scale marine reserves as a conservation and management tool has also been recognised by some other influential bodies such as the UK Royal Commission on Environmental Pollution (RCEP), who in their 2004 report on fisheries to the UK government suggested that:

*'Selection criteria should be developed for establishing a network of marine protected areas so that, within the next five years, a large-scale, ecologically coherent network of marine protected areas is implemented within the UK. This should lead to 30% of the UK's exclusive economic zone being established as no-take reserves closed to commercial fishing.'*³²

In the years since the publication of *Roadmap to Recovery* some substantial marine reserves have actually been established, but almost all are located within country EEZs with the exception of the South Orkneys Marine Protected Area in the Southern Ocean.

For example, in 2006 the US government established the Papahānaumokuākea (Northwestern Hawaiian Islands) Marine National Monument, encompassing nearly 140,000 square miles of US waters, including 4,500 square miles of relatively undisturbed coral reef habitat that is home to more than 7,000 species.³³ The US government eclipsed this designation three years later by barring fishing mining and other extractive uses from the Pacific waters of the Mariana Trench, Pacific Remote Islands and Rose Atoll which in total encompass a massive 195,274 square miles.³⁴ Also in 2006 Kiribati declared its intention to create the Phoenix Islands Protected Area (PIPA) at the CBD meeting in Brazil, adopting formal regulations in 2008. With a size of 408,250 km² (157,626 sq. miles) it is the largest marine conservation effort of its kind by a developing nation.³⁵

The establishment by the UK government of the Chagos Marine Protected Area in 2010, covering some 250,000 square miles around the Chagos Islands in the Indian Ocean, is further proof that the concept of putting large areas of ocean off-limits to fishing and other extractive use is gaining greater credence.³⁶ France is also making moves towards increasing protection to the waters under its jurisdiction, as signalled in an historic speech delivered by President Sarkozy in July 2009.³⁷ In the speech, Sarkozy sets out the intent to ensure that 10% of waters under French sovereignty are protected by 2012 and 20% by 2020 – a recommendation stemming from the work of the Grenelle Maritime Forum.

image As part of the Ocean Defenders Campaign the Esperanza sailed to the Pacific Ocean, sometimes referred to as the North Pacific garbage patch, to document the threat that plastic poses to environment and sea life.

image Diver and Acropora. Agincourt Reef, Great Barrier Reef, Australia

image Coral Gardens, Great Barrier Reef, Australia.

These marine reserves in waters under national jurisdiction set important precedents for what needs to be achieved on the high seas through international cooperation. The first bona fide marine reserve of significant scale on the high seas was the South Orkneys Marine Protected Area established in 2009 by the Commission for the Conservation of Marine Living Resources (CCAMLR). No fishing activities and no discharge or refuse disposal from fishing vessels are allowed in the area which covers just

under 94,000 square kilometres and will allow scientists to better monitor the effects of human activities and climate change on the Southern Ocean. The establishment of this marine reserve was facilitated by the special provisions available under CCAMLR and the Antarctic Treaty System (ATS), the kind of provisions that simply do not yet exist for other high seas areas.

While these moves are encouraging, the reality is that less than 0.5% of the world's oceans are fully protected from extractive or destructive activities.³⁸ If there is not a step change in the rate of implementation of fully-protected marine reserves we can expect further collapse of fish stocks and major changes in the nature of our marine ecosystems.



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image Aerial view of the Great Barrier reef off the Whitsunday Islands.

image Activists and renowned coral scientist Dr John 'Charlie' Veron dive for an underwater protest in the Great Barrier Reef and place a banner reading "Keep the reef great".

Marine reserves in a degraded ocean

08

At a time when ocean ecosystems all over the world may be reaching tipping points, establishing networks of large-scale marine reserves becomes an indispensable tool to building resilience – i.e. the amount of change or disturbance that can be absorbed by a system before it undergoes a major regime shift – in ocean ecosystems against the impacts of climate change and ocean acidification. For example the Manado Declaration, adopted at the World Oceans Conference in Indonesia in May 2009 and signed by 76 governments states:

*'We resolve to further establish and effectively manage marine protected areas, including representative resilient networks, in accordance with international law, as reflected in UNCLOS, and on the basis of the best available science, recognising the importance of their contribution to ecosystem goods and services, and to contribute to the effort to conserve biodiversity, sustainable livelihoods and to adapt to climate change.'*³⁹

The US Climate Change Science Program and Subcommittee on Global Change Research has reviewed the adaptation options for climate sensitive ecosystems including marine ecosystems. Chapter 8 of its 2008 report focuses on the role of marine protected areas and marine reserves.³⁹ This review concludes that implementing networks of MPAs may help spread the risks posed by climate change by protecting multiple replicates of the full range of

habitats and communities within an ecosystem. It also notes that critical areas to protect include nursery grounds, spawning grounds, areas of high species diversity, areas that contain a variety of habitat types in close proximity and potential climate refugia. Another key conclusion was that the most effective configuration of MPAs may be a network of highly protected areas nested within a broader management framework.

Accordingly, the CBD Scientific Committee has requested Parties attending COP 10 to *'further integrate climate-change-related aspects of marine and coastal biodiversity into relevant national strategies, action plans and programmes including, inter alia, national biodiversity strategies and action plans (NBSAPs), national adaptation programme of actions (NAPAs), national integrated marine and coastal management programmes, the design and management of marine and coastal protected areas, including the selection of areas in need of protection to ensure maximum adaptive capacity of biodiversity, and other marine environment and resource management-related strategies.'*¹⁴⁰

³⁹ Manado ocean declaration adopted 14 May 2009 at the ministerial/high level meeting at the World Ocean Conference, Indonesia <http://www.cep.unep.org/news-and-events/manado-ocean-declaration>.



A global network of marine reserves – What Greenpeace is proposing

Greenpeace's proposal for a global network of marine reserves was designed with the aim of protecting both those areas that are biologically rich, supporting outstanding concentrations of animals and plants, and those places that are particularly threatened or vulnerable to present or possible future human impacts, such as fishing or seabed mining.

To achieve these aims, Professor Roberts and his team brought together a mass of different kinds of biological, physical and oceanographic data. Data on oceanographic features such as water temperature gradients and upwelling areas, together with fishery and tracking data on oceanic megafauna, enabled the team to identify places that are hotspots of activity on the high seas for large-bodied and vulnerable species. They included tunas and billfish, albatrosses, turtles, pinnipeds (seals and sealions) and penguins, animal groups whose ranges cover the seas from pole to pole. To this the team added maps of cetacean diversity. To ensure that the network was truly representative, data on the distribution of different biogeographic areas, depth zones, seabed sediment types and ocean trenches was used to represent the variety of habitats and their variation across the globe. Particular attention was paid to highly sensitive deepwater habitats, using maps of seamount distribution and bathymetry to identify places vulnerable to harm by bottom fishing. The team also used bathymetric data to calculate seabed complexity, which helps in identifying biologically rich

places in the deep sea. All data was mapped using a geographic information system and gridded into 5° latitude by 5° longitude cells, the size of the smallest marine reserves that the experts considered to be viable in the high seas.

The eventual network was designed with both the help of more than 60 experts and the computer program *Marxan*, which derives different network designs that will meet required conservation targets while simultaneously minimising costs. The resulting network design consisted of 29 separate marine reserves that together encompass 40.8% of the area of the world's oceans and represent the full range of high seas biodiversity.

In the introduction of *Roadmap to Recovery* it was noted that the design for a global network was based on the best available information at that time and as more information came to light the boundaries of certain of the proposed high seas marine reserves might need to be refined. Reviewing the original proposal in 2010 Greenpeace notes that as predicted some refinements are required, though the biological case for protecting large areas in the regions identified remain totally valid.

Specifically Greenpeace has done further focused work on the Mediterranean. Using finer scale data, Greenpeace has produced a more detailed design for a regional network that includes areas in the central and east Mediterranean noted as important in the original high seas network proposal.

Currently, less than 1% of the world's oceans are protected from extractive industries such as fishing and energy exploration


The waters around Antarctica were singled out as in need of special protection, and since publication of the original network proposal it is encouraging to note that work is underway within the Antarctic Treaty System (ATS) to create a network of protected areas across the Southern Ocean by 2012. There is a strong argument, however, to protect the Southern Ocean in its entirety in order to complete the circle of protection set in motion when the continent and waters of Antarctica were designated 'a natural reserve for peace and science'. The continent itself has been afforded that level of absolute protection – however not so the surrounding ocean, where the hunting of whales and industrial fishing for krill and toothfish still take place. Although a mechanism exists to create fully-protected areas in Antarctic waters, the ambition and commitment is lacking even here. For example, ongoing discussions are seeking to water down and fragment the protection proposed for the Ross Sea, the most pristine and intact marine ecosystem left on the planet, which surely merits protection in its entirety.

At the opposite end of the planet, a lack of data for the Arctic Ocean meant that the original Greenpeace network proposal included a number of 'representative' areas, highlighting the need for protection but underscoring the need for further information. In the intervening years since the original proposal was produced, the race to exploit the resources of the Arctic Ocean has accelerated with

the retreating of the sea ice due to climate change. The poor knowledge of the vulnerable Arctic Ocean ecosystem and the lack of maps and other data necessitate that a precautionary approach is taken and Greenpeace believes that as a first step a moratorium on all industrial activities is agreed on the area that has historically been covered and protected by Arctic sea ice while an overarching governance regime is negotiated for the Arctic Ocean. Many of the clear governance gaps that have been identified with respect to the protection and sustainable management of the Arctic Ocean mirror the gaps for other high seas areas and need to be overcome before a global network of marine reserves can be fully implemented.

Various political developments in the Pacific mean that significant progress is being made towards protecting large ocean areas in the region, including the waters of the high seas pockets located in between the EEZs of the Pacific Island Countries and area identified but not fully described in *Roadmap to Recovery*.

Fig 1: Greenpeace's proposal for a global network of high seas marine reserves covering 40% of the world's ocean (adapted from *Roadmap to Recovery*)

 Proposed marine reserves
 Proposed moratorium area in Arctic Ocean



- | | |
|--|--|
| 1 Greenland Sea | 10 Southern Ocean |
| 2 North Atlantic | 11 Ross Sea |
| 3 Azores/Mid-Atlantic Ridge | 12 Central Indian Ocean-Arabian Sea |
| 4 Mediterranean network | 13 Bay of Bengal |
| 5 Sargasso Sea/Western Atlantic | 14 Northwestern Australia |
| 6 South-Central Atlantic | 15 South Australia |
| 7 Antarctic-Patagonia | 16 Lord Howe Rise and Norfolk Ridge |
| 8 Vema Seamount-Benguela | 17 Coral Sea |
| 9 South Africa-Agulhas Current | 18 West Oceania Marine Reserve |



- 19 Western Pacific & Greater Oceania Marine Reserves
- 20 Moana Marine Reserve
- 21 Kuroshio-Oyashio Confluence
- 22 Sea of Okhotsk
- 23 Gulf of Alaska
- 24 Northeastern Pacific
- 25 Southeastern Pacific

What a network might look like – Case studies

10

Since publication of *Roadmap to Recovery*, Greenpeace has been campaigning for the establishment of marine reserves at both the regional and national level. Each of the chosen areas illustrates some of the challenges to implementing a global network of marine reserves as well as having their own specific issues. Working to fast-track the creation of marine reserves in these areas will hopefully not only be of benefit to the areas themselves but will help guide and catalyse the process in other areas.

11

- 1 Arctic Ocean
- 2 Southern Ocean
- 3 Ross Sea
- 4 Mediterranean
- 5 North and Baltic Seas
- 6 West and Central Pacific
- 7 Japan
- 8 Brazil
- 9 Chile
- 10 India
- 11 Bering canyons



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10.1. The High Seas

The international waters of the high seas which lie beyond countries' EEZs belong to everyone. For centuries the resources of these global commons were thought inexhaustible, however we now know this is not the case. Fishing is the primary threat for many areas as exemplified by the three case studies presented here, the Mediterranean, the west and central Pacific and the Ross Sea. Even vulnerable deep sea fish species, such as the orange roughy, are not safe; trawls and gill nets now penetrate to depths of 2,000 m, while longlines can fish to 3,000 m⁴¹. One study found that declines in deep sea fish stocks had been so severe since the onset of fishing off the Canadian east coast that many target species qualify as being Critically Endangered according to the criteria developed by the World Conservation Union.⁴² Furthermore, deep-sea fisheries do not only devastate the target species, but cause massive collateral damage to deep sea habitats, tearing up ancient deep-sea corals and other vulnerable species.⁴³

These high seas fisheries do not operate entirely without regulation – there exist a bewildering array of Regional Fisheries Management Organisations (RFMOs) with different remits as to what species and what areas and depth ranges they have jurisdiction over. Some have mandates to manage stocks from the seabed to the surface, while some like the regional tuna commissions are tasked only to manage a single species. Some high seas areas are not covered by any agreements at all. The overall performance of these RFMOs has to date been disappointing, with many failing to protect the stocks they are supposed to manage or prevent wide-scale damage to the ocean environment.

With many oil and gas fields on the continental shelves nearing the end of their productive lives - such as those in the North Sea - oil and gas companies are looking for new reserves. Fossil fuel exploration and drilling (see *Oil exploration and production* on p. 48) has expanded into previously inaccessible areas with new technological innovations making offshore and deep water drilling possible.

Bioprospecting – the exploitation of genetic resources for both scientific and commercial purposes – is taking off in the marine context with a special interest being taken in the properties of those organisms inhabiting the extreme environments of the polar oceans⁴⁴ and the deep seas, including those inhabiting the toxic environments associated with hydrothermal vents. Many of these deep sea species have developed unique biological and physiological characteristics that enable them to survive in very cold, dark and highly pressurised environments. The biochemicals found in these animals and micro-organisms could prove to be integral in developing new products for use in the health, pharmacology, environmental and chemical sectors. However, these organisms and ecosystems are highly vulnerable to potential detrimental impacts including over-harvesting, pollution and habitat disturbance. Currently there is no adequate legal regime to effectively protect and conserve these deep-sea genetic resources or enable the fair and equitable sharing of the benefits that may be derived from bioprospecting in areas beyond national jurisdiction.⁴⁵

Similarly, the extraction of mineral resources from the high seas is becoming both technically feasible and more economically viable, as illustrated by China's submission in June 2010, of an application with the International Seabed Authority – a body created under the 1982 United Nations Convention on the Law of the Sea – to extract ore from an underwater ridge in the Indian Ocean.⁴⁶ Unlike bioprospecting or indeed fishing, there is a governance regime for regulating deep-sea mining covering the whole of the high seas in the form of the International Seabed Authority (ISA). There are however significant gaps within the deep seabed regime, both because when the regime was negotiated in the early 1980s, little was known about life in the deep sea, and because the regime and its regulations are only applicable to areas beyond the continental shelf.⁴⁷

Other potential threats to the high seas include proposals for ocean fertilisation activities and for the disposal of CO₂ into the water column or at the seabed in deep waters.

Ocean fertilisation is the process of dumping large amounts of nutrients into the ocean to stimulate the growth of phytoplankton blooms, which it is assumed may then act as an artificially enhanced carbon sink, drawing additional carbon dioxide from the atmosphere and transferring a significant proportion of it to deep water. This idea is being actively promoted by some individuals and companies as a possible climate fix, despite the fact that there is no evidence (despite numerous experiments over nearly two decades) that adding iron or nitrogen-based nutrients to those waters where primary production appear to be limited by lack of nutrients will bring any benefits to the climate. At the same time, however, there is every possibility that unpredictable, wide-ranging, and potentially irreversible impacts will occur on plankton community structure and ocean ecosystems as a whole as a result of such large-scale human interventions.⁴⁸

The Intergovernmental Panel on Climate Change (IPCC) considers iron fertilisation to be no more than 'speculative' as a climate change mitigation strategy. Others go further. In 2007, the Parties to the London Convention and the London Protocol endorsed a 'Statement of Concern' from its scientific groups (which provide scientific advice on protection of the marine environment to governments in more than 90 countries worldwide) on ocean iron fertilisation which concluded that '*knowledge about the effectiveness and potential environmental impacts of ocean iron fertilisation currently is insufficient to justify large-scale operations*'. This statement was further endorsed by the United Nations General Assembly in their 2007 Oceans Resolution.

Proponents of schemes aimed at direct ocean disposal (often termed 'storage') of CO₂ seek to 'accelerate' the natural absorption of CO₂ by injecting CO₂ directly into the water or directly on the ocean floor via pipelines. However, the storage is not permanent. Once in the ocean, the CO₂ eventually dissolves, disperses and returns to the atmosphere as part of the global carbon cycle. Some computer models estimate that injected CO₂ would be isolated from the atmosphere for several hundred years at most, with the length of storage dependent on injection depth.⁴⁹ In addition to lack of permanency, there are many other substantial concerns with ocean storage. CO₂ stored in this way cannot be easily monitored or controlled and negative impacts on the ocean environment due to acidification and other changes in ocean chemistry are unavoidable.⁵⁰ Ocean storage remains in research stages, and has not yet been deployed or demonstrated even at pilot scale.⁵¹ International legal instruments, such as the London Protocol* and OSPAR Convention, already effectively prohibit it.

The case studies that follow not only illustrate some of the threats facing specific ocean areas and expose the multiple failings of the current patchwork of ocean governance mechanisms, but point to the solutions and the work that Greenpeace is doing to bring these solutions into being. With sufficient political support, large scale marine reserves can be established in these areas and the health of these high seas areas restored.

* Most recently, the international London Convention (1972) adopted protocol that expressly forbids the dumping of CO₂ streams unless: '(1) disposal is into a sub-seabed geological formation; (2) they [the streams] consist overwhelmingly of carbon dioxide; and (3) no waste is added for the purpose of its disposal. In other words, these rules do not permit CO₂ sequestration in the deep oceans themselves.
<http://www.londonconvention.org>

10.1.1 The Mediterranean

The Mediterranean Sea contains some of the most complex and diverse high seas areas in the world, a sea that represents only 0.7% of the world's oceans yet are home to 8 – 9% of known marine species.

Exploitative human activity is putting the health of the Mediterranean Sea at risk. Overfishing, oil and gas exploration and production, pollution, destructive fishing methods and climate change are increasingly degrading Mediterranean marine ecosystems. The continued failure to create an effective oceans governance system for the region is only making matters worse.⁵²

The near collapse of northern bluefin tuna populations is perhaps the most visible example of how oceans and fisheries management have failed the Mediterranean. States and the responsible regional fisheries management body, the International Commission for the Conservation of Atlantic Tunas (ICCAT), have allowed Mediterranean bluefin fishing to continue despite repeated scientific warnings that a halt to fishing is needed to allow the species to recover. Current oceans management systems have failed to protect bluefin spawning and nursery areas, reduce fleet capacity and catch limits according to scientific advice and have helped place the Mediterranean bluefin at the brink of extinction

A similar plight is shared by swordfish, sharks and other marine life, including deep-sea corals, dolphins, seals and turtles. The reality is that reckless human activity is causing Mediterranean biodiversity to rapidly decline.

Through the Barcelona Convention (BARCON) system, Mediterranean states have pledged to create a network of marine protected areas by 2012 to implement the CBD target on marine protected areas. With less than three years remaining to meet this deadline, currently less than 1% of the Mediterranean Sea has been properly designated as protected areas.

The heavy use of the Mediterranean by the surrounding countries means that the establishment of a regional network of marine reserves to protect and restore the full range of Mediterranean marine habitats and species is especially urgent. As noted in *Roadmap to Recovery*, the high seas begin at the boundary of territorial waters, 6 or 12 nautical miles from the coast. In our original network design, two broad areas were identified as having particularly high biodiversity values, the central and eastern Mediterranean, but it was also noted that these were not the only areas that warrant protection.

Acknowledging this, Greenpeace then developed a proposal for a regional network in the Mediterranean that took into account the finer scale distribution of ecological features and human activity compared to other high seas areas. This was launched in the Greenpeace report titled *Marine Reserves for the Mediterranean Sea* in 2006.⁵³

The Mediterranean represents only 0.7% of the area of the world's oceans, but contains 8 – 9% of known marine species – some 10,000 – 12,000 species have been recorded to date, of which 28% are endemic

Fig 2: Greenpeace proposal for a network of marine reserves for the Mediterranean Sea



- | | | |
|---|------------------------------|---------------------------------|
| 1 Alboran Sea | 13 Maltese slope | 24 Thrakiko Pelagos |
| 2 (& 6) Seamounts | 14 Medina Ridge | 25 Limnos - Gökçeada |
| 3 Balearic Islands | 15 Gulf of Sirte | 26 Crete to Turkey |
| 4 Gulf of Lions | 16 Libyan head | 27 Central Levantine Sea |
| 5 Algerian stretch | 17 Upper Adriatic | 28 Anaximander Mountains |
| 7 Carthagian stretch | 18 Pomo/Jabuca Trench | 29 Cypriot Channel |
| 8 Ligurian Sea | 19 Otranto channel | 30 Eratosthenes Seamount |
| 9 Central Tyrrhenian Sea | 20 Hellenic trench | 31 Phoenician coast |
| 10/11 Messina Strait (north and south) | 21 Olimpi | 32 Nile fan |
| 12 Sicilian Channel | 22 Saronikos Gulf | |
| | 23 Sporades Islands | |

A recent extraordinary BARCON meeting of the Specially Protected Areas focal points held in Istanbul in June 2010 resulted in some positive developments with regard to building a future Mediterranean network. Twelve areas, covering approximately 20% of the Mediterranean Sea have been listed as Priority Conservation Areas and these areas are likely to contain sites that will be added to the Specially Protected Areas of Mediterranean Importance (SPAMI) list. The 12 areas show considerable overlap with the areas previously identified by Greenpeace, including the Balearics and the Sicilian Channel, are on the list.

Furthermore, some countries expressed at the meeting their willingness to work on future official SPAMI proposals. France, in line with its new oceans policy, is keen to collaborate with Spain on the Gulf of Lyons and has offered to lead research on the deep-sea canyons found throughout the Mediterranean. Spain for has expressed willingness to continue to collaborate with France and also Morocco with regard to the Alboran Sea.

Building an integrated governance system for the Mediterranean

The BARCON process presents the best opportunity in the short-term for the Mediterranean countries to make some meaningful progress towards achieving their international commitments. However, only a single area in waters beyond national jurisdiction has been designated so far. At a minimum, Mediterranean countries must adopt a first set of sites towards a comprehensive and representative network that includes sites of critical importance to threatened and endangered species and deep sea habitats at the next BARCON Conference of the Parties in 2011.

In order to avoid the creation of a Mediterranean network of 'paper parks' that do not convey any real protection, strong management measures need to be put in place. To do this effectively will require both input from a wide range of stakeholders, such as the scientific and fishing communities, and also direct collaboration with a wide range of regional fora and bodies that have competence over the activities that take place in those areas, including the relevant RFMOs. Furthermore, multilateral agreements should be set up to ensure closer cooperation between countries sharing the management of particular marine reserves. However the piecemeal nature of the current governance regime and the many gaps have lead to loopholes that are too often used by Mediterranean governments which greatly hinders the possibility of creating an effective network of marine reserves.

Looking ahead, a reliable system of integrated environmental governance, which overlooks the entire ecosystem and covers all sectors is needed for the Mediterranean as is the case for most of the high seas. At the global level this could be achieved by the development of a new implementing agreement under UNCLOS. Such an agreement should address the governance gaps relating to the protection of biodiversity in areas beyond national jurisdiction in a similar fashion to the way the Fish Stocks Agreement addresses issues relating to straddling stocks of migratory fish. Among other things, such a framework would provide both the mandate and mechanism to establish marine reserves on the high seas. These provisions would still have to be implemented through a number of bodies at a regional level. Greenpeace has suggested that a number of Regional Ocean Management Organisations (ROMOs) deliver integrated ecosystem based management including the establishment of marine reserves on the high seas. In the Mediterranean context, an enhanced Barcelona Convention could carry out that function, providing that regional agreements such as ICCAT were modified so that they were in line with the objectives, principles and recommendations of the Barcelona Convention.

image Bluefin tuna inside a transport cage.

image A tuna cage in the Mediterranean bluefin tuna fishing grounds.

image A Seastar, Peltaster placenta.

Such an enhanced BARCON system would establish a direct working relationship with the existing RFMOs and other relevant bodies and adopt a coherent and coordinated programme of work. New protocols would need to be developed to address specific gaps and it is likely that new organisational structures would need to be developed to deal with implementation and enforcement issues.

The ideas sketched out here have been developed in much more detail by Greenpeace in *Mediterranean Marine Governance: a vision for a sustainable future*.⁵⁴ Such an enhanced Barcelona system would provide the bedrock for a modernised governance system for the Mediterranean, as well as vision and strategy for the conservation and management of the Mediterranean and its resources and secure a sustainable future for generations to come.



image Jellyfish, common at Las Palomas Island near Cartagena in August. This one does not sting humans. Juvenile fish often shelter under jellyfish like this.

The Balearic Islands and the Sicilian Channel

Of the 32 areas identified by Greenpeace for a future regional network, the biodiversity-rich areas of the Southern Balearics and Sicilian Channel are considered priority areas for protection by Greenpeace. As a contribution to the process of identifying marine areas in need of protection in ABNJ under the CBD and BARCON Regional Activity Centre on Specially Protected Areas (RAC/SPA), Greenpeace developed a technical report which demonstrates the ways in which the Southern Balearic Islands and the Sicilian Channel meet the CBD criteria for identifying significant marine areas in need of protection (COP 9, Decision IX/20).⁵⁵

Balearic Islands

The waters south of the Balearics are among the most species rich in Europe. These waters comprise a unique area within the Mediterranean with three seamounts, a submarine volcanic field, two canyon systems and a submarine ridge. The Balearics' marine ecosystems are diverse, ranging from shallow water habitats such as the *Posidonia* seagrass meadows, maërl beds and coral fields, to deep basin seafloor habitats. These waters also encompass spawning grounds of the threatened bluefin tuna, swordfish, albacore tuna and other pelagic fish in the Mediterranean Sea. Recent studies show that bluefin tuna not only comes to this area every year to spawn, but also stays longer in the area to feed before continuing migration. Many species of marine mammals can be found in this biodiversity-rich area, as well as loggerhead sea turtles and the Balearic shearwater, a seabird which breeds on the islands and nowhere else on earth.

In 2008 and 2009 Greenpeace visited the Balearic islands to document its impressive ecosystems and met with regional government leaders, fishermen, scientists, divers and representatives of the tourist industry, all of whom joined in the call for greater protection of the waters surrounding the Balearic Islands.

The Sicilian Channel

The Sicilian Channel is the area where the western and eastern sub-basins of the Mediterranean meet to create a unique productive and biodiversity-rich hotspot. The Channel contains a number of underwater canyons, trenches and seamounts. During the summer of 2009, Greenpeace's flagship, the *Rainbow Warrior*, documented the fascinating and vulnerable high seas banks in the Sicilian Channel: the Skerki bank, the Adventure bank, Talbot bank and the bank adjacent to the Island of Pantelleria.

While the top of the banks are usually covered by meadows of brown algae and seagrass such as *Posidonia* meadows, their most spectacular parts are sheltered under rocks, where a rich assembly of filter feeding organisms can be found, such as the orange Mediterranean corals and colonies of yellow corals and sponges. The banks provide suitable habitat for a wide variety of sea life, from invertebrates to fish; crayfish, moray eels, common torpedoes and others. However, large predatory fish are relatively scarce and ghost nets, fishing net remnants which have been abandoned at sea, are clear indicators of excessive fishing pressure. The Sicilian Channel is a known fishing ground for demersal fish, but the lack of protection of key

nursery grounds has driven the stocks to depletion. Illegal, unregulated and unreported (IUU) fishing is a known problem in the Mediterranean Sea and a major threat to the Sicilian Channel. During investigative expeditions, Greenpeace ships have documented illegal fishing in the area, including fishing with driftnets – or the ‘walls of death’ as they are more commonly called – a gear banned by both the UN and the EU since 2002.

Both the Southern Balearics and Sicilian Channel regions are subject to heavy impacts resulting from a range of human activities, but especially fishing pressure. Fishing activities in the areas include purse-seine fishing for bluefin tuna during the species' spawning season, longlining; shallow and deep-water bottom trawling, artisanal gillnetting and recreational sports fishing.

Marine life in both areas is also threatened by excessive coastal development, oil, chemical, plastic and noise pollution, shipping, invasive species and increasingly, climate change. The case for establishing marine reserves in these two areas is compelling.

10.1.2 The Pacific

The Western and Central Pacific Ocean is the world's largest tuna fishery. Over half of the tuna consumed worldwide is taken from this area, especially from the waters of the Pacific Island countries. Increasingly rampant overfishing by foreign fleets using wasteful fishing methods such as fish aggregation devices (FADs) is destroying both the fishery and the marine biodiversity in an area that was considered relatively healthy just a few years ago. Today, two key Pacific species, bigeye and yellowfin, could face collapse unless urgent action is taken.⁵⁷ One study estimated that the mean annual catch for sharks during the period from 1990 -2004 was 696,401 fish.⁵⁸ Alarming, the catch was higher in the more recent years at more than 1 million sharks a year.

Currently foreign ships take 80% of Pacific tuna. Distant water fishing fleets from Japan, China, the Philippines, Taiwan, Korea, the US and the EU have fished out their own waters and are now plundering

the waters of the Pacific Island countries and the surrounding international waters. Pacific Island countries only get around 6% of the value of the fish caught in their waters through access fees.⁵⁹ For the Pacific Island countries, good oceans management of their fisheries is not just about economics. Pacific Islanders are highly dependent on fish for food with fish consumption four times higher than the global average.

A lack of monitoring control and surveillance resources and the large areas involved mean that IUU fishing is rife in the region. Globally pirates steal up to \$9 billion US dollars' worth of fish from our seas and in the Pacific, illegal fishing steals fish worth four times more than the region earns in licence fees. Nearly a quarter of all tuna taken from the Pacific comes from international waters. Fishing vessels often fish in national waters and then claim that the catch came from international waters. In particular foreign fishing operations take advantage of the existence of a number of high seas pockets located in between

Marine reserves as a means of protecting migratory species

While the benefits of protection may be more apparent for species spending much or all of their time within a marine reserve, reserves can also offer protection to migratory species such as sharks, tuna and cod, particularly if reserves are created in places where these species are especially vulnerable.

Neither migratory species nor the fishermen who pursue them are evenly distributed through the oceans and their movements are not random. Most migratory species undergo migration bottlenecks or use places that are critical to particular life stages. Likewise, fishermen target their quarry in particular places and at particular times when the target species is at its most vulnerable. Creating marine reserves to protect known spawning grounds, nursery areas, aggregation sites such as seamounts and migration bottlenecks are all likely to yield benefits.

The changes that occur as a result of establishing a marine reserve are very difficult to predict. By establishing large-scale marine reserves there are likely to be increases in habitat and ecosystem complexity, increases in biomass and enhanced feeding opportunities for both prey and predators. Highly migratory species when encountering such reserve areas may spend more time there compared to areas outside due to better feeding conditions and consequently benefit from the protection afforded in the reserves.⁶⁰ Most of the thinking around potential reserve effects has not considered such possible shifts in habitat use.

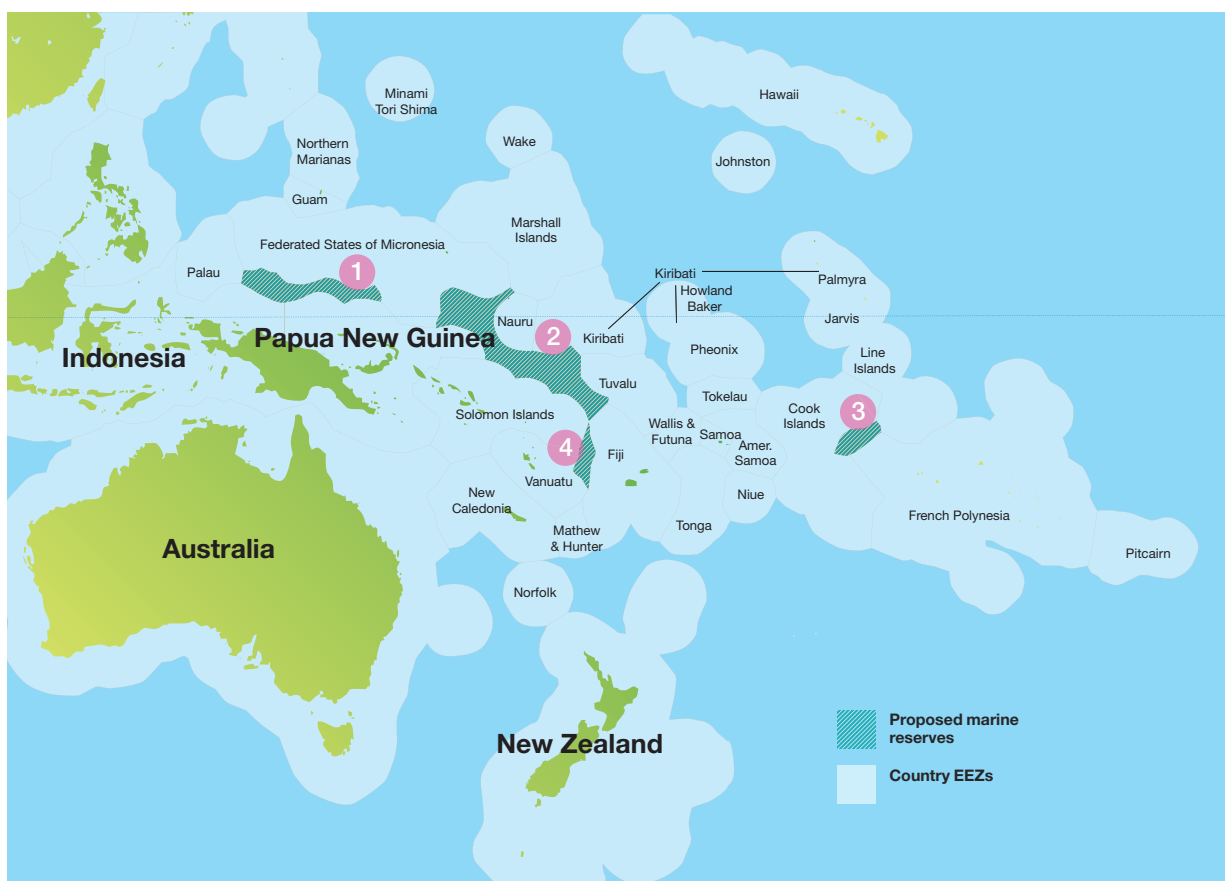
By taking into account information relating to the critical habitats and the behaviour of migratory species and ensuring that an adequate proportion of their critical habitat is protected, it should be possible to establish marine reserves that benefit these species.

the EEZs of the Pacific Island countries to offload their catches, and refuel at sea. This makes it much easier for these vessels to avoid enforcement and monitoring and conceal and how much they have caught, and for how long they have been at sea.

As a means of restoring the declining tuna stocks, protecting marine biodiversity and clamping down on IUU fishing, the Parties to the Nauru Agreement (PNA)

– Federated States of Micronesia, Kiribati, Marshall Islands, Nauru, Palau, Papua New Guinea, Solomon Islands and Tuvalu – have already taken measures to stop all tuna fishing in two of the high seas pockets totaling 1.2 million km² as of January 2010 – a move actively called for and supported by Greenpeace.

Fig 3: Map of the West and Central Pacific high seas pockets, candidate sites for marine reserves



1 West Oceania Marine Reserve (WOMAR): located between the EEZs of Papua New Guinea, Indonesia, Palau and the Federated States of Micronesia.

2 Greater Oceania Marine Reserve (GOMAR): located between the EEZs of the Federated States of Micronesia, Marshall Islands, Nauru, Kiribati, Tuvalu, Fiji, the Solomon Islands and Papua New Guinea.

3 Moana Marine Reserve (MOANA): located between the EEZs of the Cook Islands, French Polynesia and Kiribati.

4 Western Pacific Marine Reserve (WPMR): Located between the EEZs of Fiji, Vanuatu and the Solomon Islands.

In 2008 agreements were made to close two of the four high seas pockets, areas 1 and 2 illustrated in Fig 3, to purse seine fishing for tuna by the parties to the Nauru Agreement (PNA).^{*} These agreements were then endorsed by the Western and Central Pacific Fisheries Commission (WCPFC) when the regional tuna commission met at the end of 2008 with implementation beginning in January 2010. By adding in a conditional clause to their national fishing licence agreements, the Pacific Island countries have also managed to limit other forms of tuna fishing in these areas.

Despite resistance from the East Asian fishing nations, the PNA announced in April 2010 that it will also unilaterally close the high seas pockets, areas 3 and 4 in fig 3, and also some other large areas of the open high seas to purse seine fishing as of January 2011. This will make the total areas closed to purse seine fishing in the Pacific over 4.5 million sq km – one of the largest ocean protection moves in history. There is intention from the Pacific Island countries to extend these closures to include longlining in due course and to get the WCPFC to agree to compatible measures.

Although direct data regarding the ecological and biological characteristics of the four high seas pockets is limited, Greenpeace conducted a study to assess how well the four areas meet the CBD criteria for ecologically and biologically significant marine areas and presented the results to the CBD Expert workshop on scientific and technical guidance on the use of biogeographic classification systems and identification of marine areas beyond national jurisdiction in need of protection, held in Ottawa, Canada in 2009.⁶⁰ A summary of the findings can be found in Table 1. The study demonstrated that the areas do in fact meet many of the criteria and the validity of a literature-based approach to identifying areas and how biological and oceanographic data can be used to infer the likely characteristics of high seas areas in areas where little research has been conducted.

Although there is both a strong biological case and a political will among the Pacific Island countries to declare the high seas pockets as marine reserves, it is not a straightforward process, as illustrated by the number of agreements that need to be made through various fora just to stop tuna fishing in these areas. The whole process would be greatly facilitated if there was an overarching framework for the protection of marine biodiversity of the high seas which included a mandate and mechanism for establishing marine reserves and enhanced cooperation and coordination of the various bodies responsible for different activities.

By putting the high seas pockets off limits to fishing, the Pacific Island countries will not only contribute to the conservation of marine biodiversity and build ecosystem resilience, but simultaneously reduce the mortality of declining tuna species such as bigeye and yellowfin and restrict the operations of IUU fishing. They will be taking an important step to securing the future of the region's life line – the tuna fisheries.

^{*} Kiribati, Tuvalu, Nauru, Marshall Islands, Federated States of Micronesia, Palau, Papua New Guinea, Solomon Islands, together these countries have up to 80% of the Pacific fisheries in their waters and thus create an important power bloc capable of pressuring fishing nations.



Table 1: Ecological and biological significance of the Pacific high seas enclaves

Criteria	WOMAR	GOMAR
Special importance for life history stages of species	<p>Pre- and post-nesting migratory routes of leatherback turtles that nest at Papua Barat, Indonesia and the Solomon Islands.</p> <p>Yellowfin tuna spawning activity, indicated by the high proportion of unassociated purse seine sets. Juvenile leatherback turtles. Potential presence is indicated by proximity to nesting beaches and a confirmed sighting from waters to the north of WOMAR.</p>	<p>Pre- and post-nesting migratory routes of leatherback turtles that nest at Papua Barat, Indonesia and the Solomon Islands.</p> <p>Migratory routes of green turtles <i>Chelonia mydas</i> moving between Marshall Islands and Solomon Islands, Australia and PNG. Data obtained from a passive tag retrieval study. The shortest routes between sites would pass through GOMAR.</p>
Importance for threatened, endangered or declining species and/or habitats	<p>Pre- and post-nesting migratory routes of leatherback turtles (CR) that nest at Papua Barat, Indonesia and the Solomon Islands. Papua Barat is thought to be the site of the largest remaining nesting population in the Pacific Ocean.</p> <p>The presence of hawksbill <i>Eretmochelys imbricata</i> (CR), green (EN) and olive ridley <i>Lepidochelys olivacea</i> (VU) turtles, and bycatch mortality, has been recorded by fishery observers.</p> <p>Bigeye tuna (VU) and yellowfin tuna are targeted by longline and purse seine fisheries. Populations of both species are declining in the western and central Pacific.</p>	<p>Pre- and post-nesting migratory routes of leatherback turtles (CR), that nest at Papua Barat, Indonesia and the Solomon Islands. Papua Barat is thought to be the site of the largest remaining nesting population in the Pacific Ocean.</p> <p>The presence of olive ridley (VU) and unidentified sea turtle species, and bycatch mortality, has been recorded by fishery observers. Green turtles (EN) are the most commonly recorded sea-turtle bycatch species in tropical waters and their presence is likely.</p> <p>Bigeye tuna (VU) and yellowfin tuna are targeted by longline and purse seine fisheries. Populations of both species are declining in the western and central Pacific.</p> <p>Historically high abundance of sperm whales <i>Physeter macrocephalus</i> (VU) is demonstrated by whaling logbook records. Corresponds to the western extreme of the 'On the Line' whaling ground.</p>
Vulnerability, fragility, sensitivity or slow recovery	<p>Leatherback, hawksbill, green and olive ridley sea turtles.</p> <p>Mussau Ridge could potentially include areas of fragile and sensitive deepwater benthic habitat.</p>	<p>Leatherback, olive ridley and unidentified sea turtles (likely presence of green turtles).</p> <p>Historically high abundance of sperm whales.</p>
Biological productivity	<p>High abundance of tropical tuna, characteristic of the Western Warm Pool biogeographical province, is indicated by longline and purse seine fishing effort. Productive foraging area for predatory species is created by the advection of low trophic level species from the Eastern Warm Pool Convergence Zone.</p> <p>Phytoplankton blooms in the North Equatorial Counter-Current result from upwelling associated with current meandering.</p> <p>Mussau Ridge could potentially include areas of elevated secondary productivity, associated with deepwater seamount habitat.</p>	<p>High abundance of tropical tuna, characteristic of the Western Warm Pool biogeographical province, is indicated by longline and purse seine fishing effort⁹. Productive foraging area for predatory species is created by the advection of low trophic level species from the Eastern Warm Pool Convergence Zone.</p>
Biological diversity	<p>Mussau Ridge could potentially include areas of elevated species diversity associated with deepwater seamount habitat</p>	

VU = vulnerable; EN = endangered; CR = critically endangered.

WPMR

MOANA

Potential presence of breeding minke whales *Balaenoptera acutorostrata*. An above average encounter rate was recorded for the area encompassing MOANA during the month of October, coinciding with the species' peak conception period.

Threatened/endangered/declining pelagic predatory species potentially present at Horizon Bank include: leatherback (CR), loggerhead *Caretta caretta* (EN), hawksbill (CR) and green (EN) sea turtles; pelagic sharks, including bigeye thresher *Alopias superciliosus* (VU), oceanic whitetip *Carcharinus longimanus* (VU) and shortfin mako *Isurus oxyrinchus* (VU) (all recorded as bycatch in WCP-CA); cetaceans, including sperm whales (VU); and bigeye (VU) and yellowfin tuna.

Horizon Bank could potentially include areas of fragile and sensitive tropical coral habitat. Horizon Bank and other seamounts could potentially include areas of fragile and sensitive deepwater benthic habitat. Vulnerable pelagic predatory species potentially present at Horizon Bank include pelagic sharks, cetaceans, sea turtles and seabirds.

Pelagic productivity is potentially elevated at Horizon Bank, due to enhanced primary production and/or increased forage availability. Horizon Bank could potentially include areas of productive tropical coral habitat. Horizon Bank and other seamounts could potentially include areas of elevated secondary productivity, associated with deepwater seamount habitat. Potential presence of hydrothermal vent communities on the central spreading axis of the North Fiji Basin and/or South Pandora/Rotuma Ridge.

Potential area of high diversity at Horizon Bank, due to the combined presence of pelagic and shallow and deep-water benthic species.

The Emergence of a Pacific network

The protection of the high seas pockets should not be viewed in isolation. Looking at the big picture in the Pacific, momentum is really building towards the establishment of a regional network of large scale protected areas that can actually meet the CBD and WSSD targets and deliver on a broad range of conservation and fisheries objectives, increasing food security and ensuring the livelihoods of the many people who are dependent on a healthy Pacific for their survival.

Australia's Great Barrier Reef Marine Park blazed the trail in terms of setting aside large marine areas as no take zones and there is currently a campaign underway to significantly extend the amount of Australia's waters that are fully protected by the creation of a Coral Sea Heritage Park, which would protect over 1,000,000 km² of Australian waters between the eastern boundary of the Great Barrier Reef Marine Park and the maritime borders with Papua New Guinea (PNG), the Solomon Islands and New Caledonia.⁶¹ The establishment of the Papahānaumokuākea (Northwestern Hawaiian Islands) Marine National Monument and the Mariana Trench, Pacific Remote Islands and Rose Atoll Marine National Monuments demonstrate that the US government also understands the value of large scale marine reserves.

But it is not only Australia and the US that have been setting aside large areas, enormous credit should go to the Pacific Island countries for a number of initiatives that send a strong signal to the rest of the world that they see marine reserves not as a luxury, but as essential to ensuring the long term futures of their fisheries and peoples. In fact, the concept of no-take marine reserves is not new to Pacific islanders. For thousands of years, *tabu* (off-limit) areas were crucial to maintaining healthy fisheries in the Pacific.

The Fiji government threw down the gauntlet to the rest of the world in 2005 with its commitment to implement a network of marine areas in 30% of its Exclusive Economic Zone (EEZ) by 2020. Inspired by Fiji, the Micronesia Challenge was signed in 2006, bringing five Micronesian governments together in a regional commitment to conserve at least 30% of their near-shore waters and 20% of their terrestrial resources by 2020.⁶²

When the Phoenix Islands Protected Area was established by Kiribati, it was the world's largest marine reserve, including eight coral atolls and vast expanses of open-ocean and deep-sea habitat. However Kiribati has not stopped there, with other Pacific leaders welcoming the Pacific Oceanscape concept and its companion Pacific Ocean Arc initiative tabled by Kiribati aimed at increasing marine protected area investment, learning and networking. Leaders at the meeting tasked the Secretariat, the relevant agencies and key partners, to develop a framework for the Pacific Oceanscape, drawing on the Pacific Islands Regional Ocean Policy, as a priority area for attention under the Pacific Plan.⁶³

All these developments, together with France's recent commitment to protect 10% of its EEZ as marine reserves by 2020, with a 700,000 km² potential site already identified in the Marquesas Islands of French Polynesia are clear signs that momentum is building.⁶⁴

Despite all these positive developments, meeting the CBD and WSSD targets is unlikely to be enough to secure the level of protection needed to restore the Pacific to health. A recent study warns that Oceania, which includes Polynesia, Micronesia and Melanesia, is a hotspot for extinction.⁶⁵ Among factors such as climate change, ocean acidification and the encroachment of human populations on fragile reef and rainforest habitats, fishing was highlighted as one of the factors forcing widespread extinctions. The authors recommend that 30-50% of the marine habitat be closed to fishing to avoid collapse of stocks.

The clear emergence of a meaningful network in the Pacific is welcomed by Greenpeace, which encourages the countries in the region to further extend their efforts and integrate their ocean and climate policies and find the synergies between different initiatives. For example the southern hemisphere portions of the existing and proposed marine reserves fall within the boundaries of the proposed South Pacific Whale Sanctuary (SPWS), which extends north to the equator. Australia and New Zealand have lobbied for the SPWS at the International Whaling Commission (IWC) since 2000. The proposal is endorsed by members of the Pacific Regional Environment Program (SPREP) and Pacific Forum leaders but so far has failed to win the three-quarters majority required for establishment by the IWC. Nevertheless, there is continued support for a SPWS and high seas marine reserves could potentially form highly protected zones within the sanctuary should it become a reality. Furthermore, just as the SPWS would complement the Southern Ocean Whale Sanctuary, so would a Pacific network of fully-protected marine reserves complement protection efforts in the Southern Ocean. It is in this way that a global network of marine reserves can be realised and we can enable the real protection of the great whales in both their polar feeding and sub-tropical breeding grounds from the wide range of threats that they face.

10.1.3. The Southern Ocean – a model for high seas protection

Antarctica and the surrounding Southern Ocean are unique in many ways and deserving of comprehensive, and many would argue absolute, protection. Under the Antarctic Treaty System (ATS), any activities in the Antarctic must be carried out in a way that limits any harmful impacts, and any future activities must be planned with sufficient information to make informed judgments about their possible impacts. Importantly, all activities relating to mineral resource extraction, except those conducted for scientific research are prohibited, but fishing is still allowed. The Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) is the body within the ATS that is responsible for managing all fisheries south of the Antarctic Convergence, an area between 50° South and 60° South where the cold polar waters meet the warmer waters of the north (a biological barrier to most Southern Ocean species). CCAMLR is considered an international leader in its precautionary and ecosystem-based approach to fisheries management. Through the provisions of CCAMLR and the Antarctic Treaty there is a clear mechanism for establishing marine reserves and other forms of MPA and, importantly, an agreed process to create a representative and comprehensive network of protected areas by 2012, something that clearly sets the Southern Ocean apart from other high seas areas.

In 2008, 11 areas were endorsed by CCAMLR as priority areas for the establishment of MPAs and marine reserves.⁶⁶ The areas were chosen following a bioregionalisation of the Southern Ocean, using a methodology similar to that employed to design the high seas network proposed by Greenpeace. The assumption was that the high physical heterogeneity of these areas implied a high biotic diversity. These 11 areas were further endorsed by the Antarctic Treaty's Committee of Environmental Protection in 2009. This important first step towards establishing a regional network was followed up by CCAMLR in 2009 when the Commission both agreed to a timetable of work towards meeting the 2012 target and approved a new high seas marine protected area (HSMPA) south of the South Orkney

Islands.⁶⁷ The South Orkneys Marine Protected Area covers just under 94,000 km² and is closed to all types of fishing and so sets an important precedent as the first fully-protected high seas marine reserve.⁶⁸ While an important step in the right direction, it only covers approximately 0.3% of the waters south of the Antarctic Polar Front.

In order for the proposed Southern Ocean network to become a reality, CCAMLR will need to work swiftly to collate the relevant information on the 11 priority regions and other appropriate areas, characterise them in terms of their biodiversity patterns, ecosystem processes, physical environmental features and human activities and identify candidate sites in order to submit proposals for a representative network by 2012. This is entirely possible providing there is the political will.



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Ross Sea

Of the 11 areas identified by CCAMLR, the Ross Sea stands out as a priority for protection. The biodiversity of the Ross Sea is of global significance, with disproportionately large populations of many of the larger high latitude species, including penguins, seals and whales, residing over the Ross Sea continental shelf and slope. The waters overlying the Ross Sea continental shelf and slope comprise approximately 2% of the Southern Ocean (32.9 M km²) south of the Antarctic Polar Front⁶⁹ including water beneath ice shelves, an area that is small in size from a global perspective but of enormous importance biologically. Underpinning the Ross Sea ecosystem are the primary producers which are so prolific that they are important for the Antarctic as a whole – the amount of food they produce accounts for about 28% of the entire Southern Ocean.⁷⁰ Figure 5 shows a simplified representation of the Ross Sea ecosystem foodweb.

According to an independent analysis of human impacts on the world's oceans, the Ross Sea is the least affected oceanic ecosystem remaining on Earth.⁷¹ This fact, combined with a long history of scientific endeavour, make the Ross Sea a unique 'living laboratory' where climate change and its impacts can be investigated without interference from other human impacts. Fundamentally the Ross Sea foodweb has remained unchanged for millennia, except for the loss of blue whales from industrial whaling and the ongoing depletion of Antarctic toothfish. This means that the Ross Sea, unlike most other ocean areas, retains its full complement of top predators making it invaluable for studying how a fully-functional ecosystem works.

Among its diverse life, the Ross Sea contains 38% of all Adélie penguins, 26% of all Emperor penguins, 30% or more of all Antarctic petrels, 6% of all Antarctic minke whales and 6% of all Weddell seals. Despite the small area it covers, the Ross Sea is the planet's icy Galapagos.

Unfortunately, despite its remoteness, the Ross Sea has not been able to escape the attention of the fishing industry. As fish stocks have been depleted in accessible coastal waters, so has the fishing industry ventured further afield exploiting deep sea stocks and those found in the remotest ocean areas. Apart from some exploratory fishing carried out in the 1970s by Soviet trawlers, the Ross Sea was not targeted by fishing vessels until 1998 when New Zealand began longline fishing for toothfish in what is the southernmost fishing ground in the world. The largest number of vessels in the fishery was 21 in the 2004 season. During the 2009/10 season, there were 18 vessels from seven countries catching toothfish in the 2010 season.⁷² This legal fishery, together with the IUU fishing that is also known to occur in the Ross Sea, already appears to be impacting the wider ecosystem.

As a long-lived, slow reproducing species, toothfish are especially vulnerable to over-fishing. Adult toothfish can no longer be caught by scientists studying toothfish in the area of McMurdo Sound, the southern edge of the species' range.⁷³ As an important predator species within the Ross Sea, any declines in Antarctic toothfish populations are likely to have detrimental impacts on the whole ecosystem. In fact, Antarctic scientists have new evidence that the fishery may already have caused changes to the Ross Sea food web. The disappearance of Antarctic toothfish from McMurdo Sound has been linked to a decline in the numbers of fish-eating ecotype-C killer whales in the area,⁷⁴ and a change in the diet of Adélie penguins.⁷⁵

In order to ensure that the ecological, wilderness and scientific values of the Ross Sea ecosystem are preserved for this and future generations, Greenpeace is campaigning together with other members of the Antarctic and Southern Ocean Coalition (ASOC) and numerous scientists to ensure that CCAMLR confers comprehensive protection to the Ross Sea.⁷⁶

Fig 4: Greenpeace and the Antarctic and Southern Ocean Coalition are calling for the whole of the Ross Sea shelf and slope (i.e. to the 3000m isobath) to be made a marine reserve

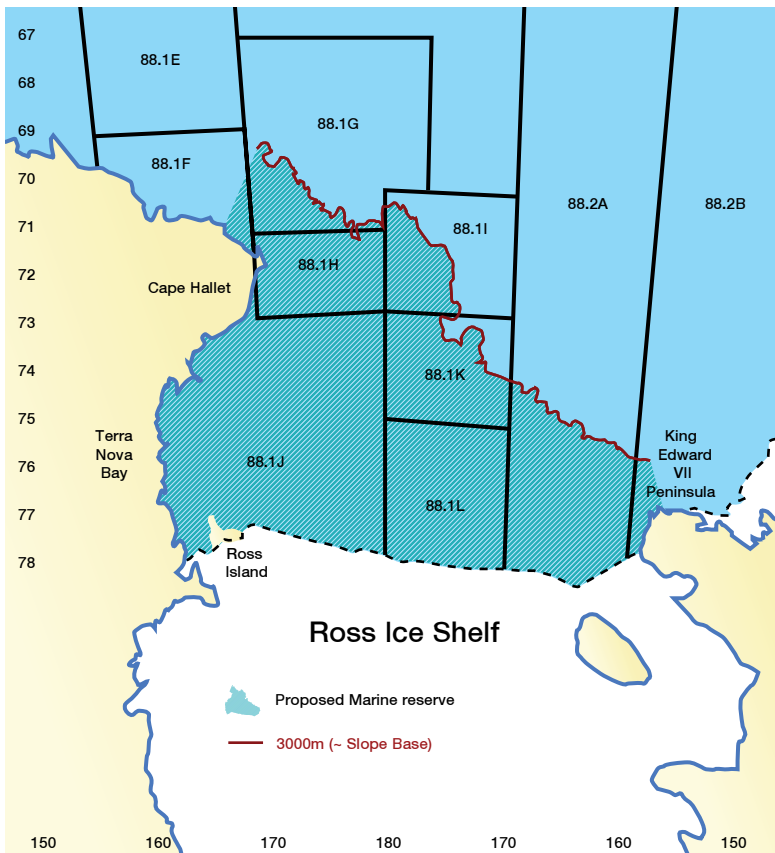
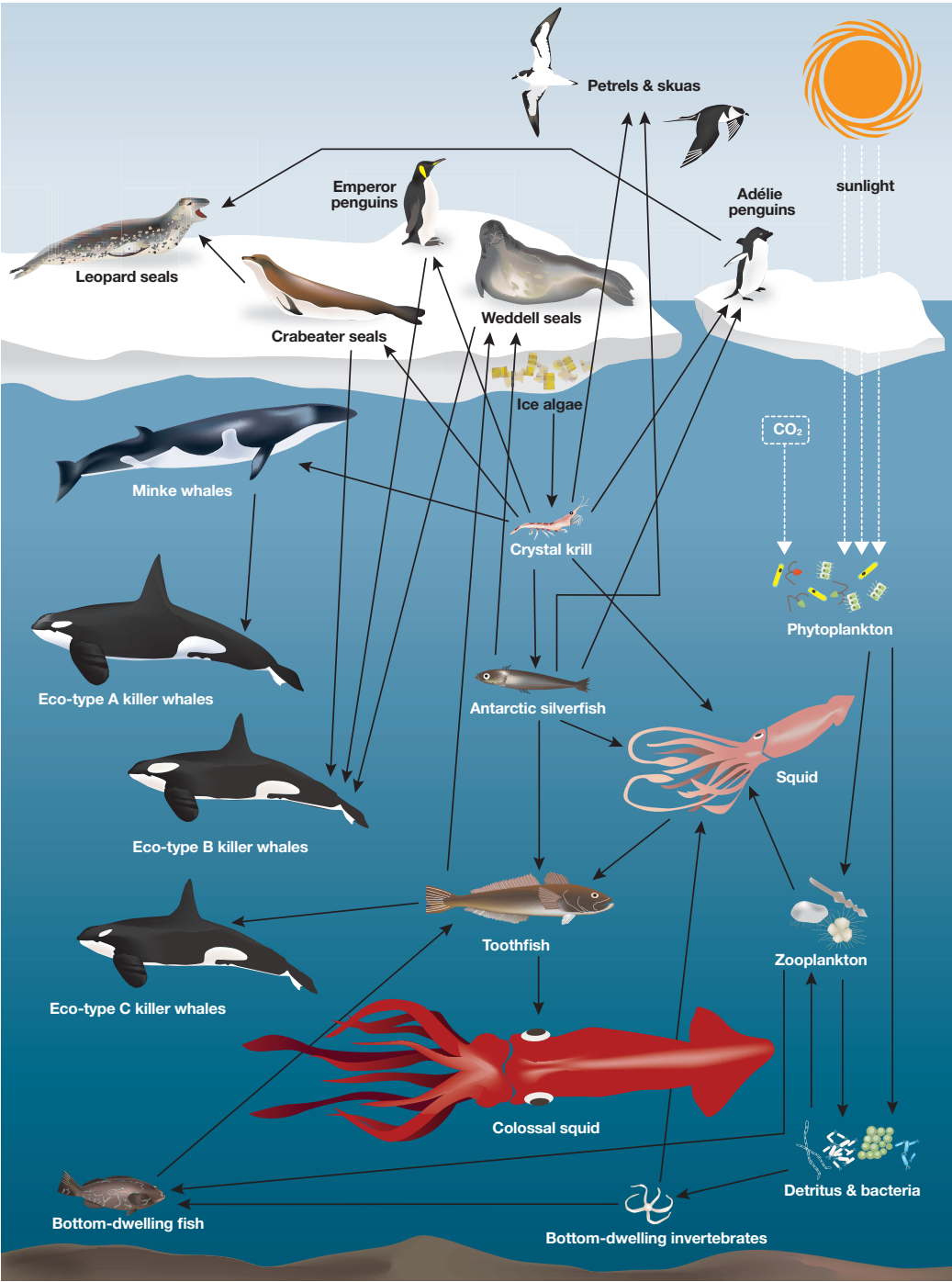


Fig 5: A simplified representation of the key species in the Ross Sea food web



10.1.4. The Arctic Ocean

At the other pole, the Arctic Ocean is under no less pressure. Once a de facto marine reserve protected by permanent sea ice, the Arctic Ocean is currently becoming accessible to industry as a result of manmade climate change causing large swathes of the year-round sea ice to melt.

Arctic and sub-Arctic waters are among the most biologically productive in the world. At present, industrial activities in the Arctic Ocean are limited by the sea ice that exists for most or all of the year. Climate change is changing all this, with both the melting of the sea ice and changes in ocean currents which causes changes in sea temperatures, leading to fish stocks changing their distribution. It is predicted that the North East Atlantic cod stock, the last of the big global cod stocks, will move North and East due to ocean changes.⁷⁷ Unsurprisingly with the opening up of these previously unexploited waters, the Barents whitefish fleet is already venturing further north than it ever has before. In June 2010, the Greenpeace ship, *Esperanza*, documented this northward creep, encountering ten Russian trawlers at almost 80 degrees north on the northern west coast of Svalbard. Cod trawlers such as these drag their heavy gear across the seabed causing extensive damage to vulnerable marine habitats such as cold water corals and sponge fields. Such damage is known to have occurred further south in areas such as along the Egga Ridge and the sponge fields located on the Tromsø Bank. The marine habitats north of Svalbard are not well understood and poorly mapped and so it is not known what impact such fishing will have on the fragile and interlinked ecosystems of the Arctic Ocean. The Greenpeace expedition conducted a series of seabed surveys in the region using a drop camera and ROV and discovered that the seabed was not the lifeless muddy bottom suggested by some, but home to a myriad of marine life including sea urchins, sea stars, sea anemones, soft corals, sea squirts, tube worms, sponges, haddock, cod, red fish and shrimps.⁷⁸

Spurred on by concerns over the impacts of climate change on fishing in the region, the North Pacific Fisheries Management Council made the sensible decision in February 2009 to establish a moratorium on commercial fishing in a vast zone off Alaska's northern coast. This move was applauded by Greenpeace, and will help give marine life in the Chukchi and Beaufort Seas a much better chance of surviving the loss of sea ice and the increasing ocean acidification that are predicted for Arctic waters in the coming decades.

Ironically it is not only the fishing industry that has its eye on the Arctic Ocean. The fossil fuel industry is also gearing up to exploit the resources that are beginning to be accessible as a result of the disappearing ice. So far, the melting sea ice has driven a rush of seabed studies, each aimed at showing the continuation of the continental shelf to the North Pole, and thus sovereignty over those parts of the Arctic. The US, Canada and Russia have dispatched icebreakers, submarines and prime ministers to pursue their sovereignty claims, and other Arctic states are also involved in the melee. The planting of a Russian flag on the Lomonosov Ridge, a 1,200-mile underwater mountain range, and Russia's claim that it had enough evidence to prove it is part of Russia's continental shelf, made worldwide headlines in 2007.⁷⁹

The 'race' to exploit the oil and gas believed to be under the Arctic ice also threatens global security. It has been identified as a serious threat to global peace with the increased activity in the region leading to discussions at NATO and to increases in Arctic military spending by the US, Canada, Russia and other Arctic nations.

Unlike Antarctica, there is no single overarching treaty governing activities in the Arctic. With only a patchwork of different rules and regulations in place, most of which are not legally binding, the Arctic Ocean and its marine life, like most other high seas areas, are currently wide open to exploitation, bad practice and illegality.

Set up in 1996, the Arctic Council – a high-level intergovernmental forum comprised of the eight

Arctic nations (Canada, Denmark/Greenland/Faroe Islands, Finland, Iceland, Norway, Russia, Sweden and the US) and six Indigenous Peoples' organisations – plays an important role in deciding our Arctic future. However, it remains to be seen if the Arctic Council will be the protector of the Arctic or its exploiter.

Despite recognising the vulnerable and unique nature of the region, and having had many years in which to develop an appropriate governance regime, the Arctic Council has only managed to put forward non-binding recommendations with no enforcement. In the meantime, the agenda of the members of the Arctic Council appears to be moving towards opening up the Arctic Ocean for oil exploration and industrial fishing, thus taking advantage of the melting ice instead of taking the action required to protect the already damaged Arctic Ocean ecosystem. In March 2010, a closed door meeting of

the Arctic coastal states in Canada brought criticism from indigenous peoples and other legitimate stakeholders including Sweden.⁸⁰

Given the issues of global significance affecting the Arctic and the many significant gaps in the existing legislation,⁸¹ there is a clear need for an overarching Arctic multi-lateral agreement or treaty in which the Arctic Council could play a leading role. Such a future agreement would need to ensure the highest levels of protection for the Arctic and in particular for the areas of the Arctic Ocean that have traditionally been protected under the ice. While such a transparent, participatory and equitable agreement is being negotiated, nations and stakeholders must 'freeze the footprint' of growing industrial activities in the Arctic. This could be achieved by establishing a moratorium on industrial activity in the area historically covered by sea ice.

**Fig 6:
Map of the Arctic
showing the average
minimum sea ice
extent from 1979 –
2000**

Greenpeace believes that a 'line in the ice' should be drawn around this area, which has historically been protected under the ice, and a moratorium on all industrial activities should be put in place until a new overarching governance regime has been agreed and implemented.



Oil exploration and production

Oil exploration and production is causing damage to the marine environment on a daily basis, not only through the emissions resulting from the burning of the oil that is produced, but from the routine pollution associated with these operations. Seismic testing and routine noise from drilling operations is known to impact cetaceans and may even cause them physical harm. Every day small spills from drilling operations and the routine operation of vessels adds to the pollution in our oceans. In the North Sea, lawful discharges from oil and gas installations accounted for the overwhelming bulk of oil inputs from this sector.⁸²

It is however, the ever present risk of large-scale spills that usually comes to mind when thinking about the environmental damage caused by this extractive industry. The Deepwater Horizon spill in the Gulf of Mexico has provided a pertinent reminder how big that threat is with an estimated 4.1 million barrels of oil crude being released into the Gulf of Mexico in the 87 days between the explosion and the well being

capped, making it the world's largest accidental spill to date.⁸³ The long-term environmental impacts of the spill, both from the oil and the widespread use of the dispersant 'Corexit', which has already been shown to be entering the food chain,⁸⁴ are unknown.

As drilling moves further offshore and into more extreme environments the risks increase. It is clear from studies and experience that the effects of oil spills in a high-latitude, cold ocean environment last much longer and are far worse than in temperate mid-latitude marine environments. Of great concern is the move by oil Shell, BP, Statoil, ExxonMobil, Cairn, Conoco Phillips, Imperial Oil and others into the Arctic Ocean. Oil spill response is limited to impossible for much of the year due to the lack of light, low temperatures, harsh storms and ice-infested waters that are the norm throughout the Arctic Ocean. Spill response infrastructure, equipment and capacity in the Arctic Ocean range from inadequate to nonexistent. As if this were not egregious enough, there is no proven technology for removing spilled oil from the Arctic Ocean.

10.2 National waters

The pressures on inshore waters are, if anything, greater than those exerted on the high seas but the existence of national legislation means that most countries are able to regulate to greater or lesser extent the harmful activities that take place within their EEZs and territorial waters and in many cases possess the necessary measures to establish fully-protected marine reserves. Consequently far more marine reserves and MPAs exist in national waters, but no country at the present time actually meets the CBD targets for all of the waters under its jurisdiction.

While the same ecological principles apply for establishing a network of marine reserves in the coastal zone, the individual reserves will be much smaller in size reflecting the different scaling of habitats and the movements of species, as well as the characteristics of the human activities, including fishing, that take place in coastal waters. The features of the high seas operate on a larger scale – the migration of pelagic species; the extent of deep-sea ridges and mountains; and variation in ocean conditions. Similarly, the fishing fleets on the high seas are designed to travel long distances. On the other hand, features of the coastal zone, such as rocky reefs, seagrass meadows, estuaries and turtle nesting beaches are on a smaller scale. Coastal fishing fleets also operate on a scale of kilometres or less, rather than hundreds of kilometres. In order to account for this, the large scale marine reserves of the open seas cannot simply be extended into the coastal zone.

Establishing national networks of marine reserves is vital to sustain the livelihoods of coastal communities, but in order for a network to be effective, it must be established in consultation with local communities. This will ensure that small-scale features are protected, while equitable access to fishing resources is maintained. The benefits that marine reserves bring for education, research, leisure and tourism will also be shared between coastal communities.

Evidence collected from around the world shows that even quite small coastal marine reserves can bring multiple economic and conservation benefits. The Apo Island marine reserve in the Philippines, the Hol Chan marine reserve in Belize, the Soufriere Marine Management Area in St Lucia and Egypt's Red Sea marine reserves are just a few examples of marine reserves that have delivered significant economic as well as conservation benefits to the local communities.⁸⁵

Greenpeace's own work in national waters, as set out in the case studies below, emphasises the need for collaboration between the relevant stakeholders when designing and implementing marine reserves and, in particular, the importance of recognising the needs of small-scale and artisanal fishermen. This is as true for Alaska as it is for India.

10.2.1. Japan

As previously noted, tuna are a globally important food item and the tuna industry provides a livelihood for many millions of people around the globe. In Japan, tuna is especially important and is a key element of Japanese food culture, so much so that Japan consumes 25% of the world's tuna and 80% of the world's bluefin tuna. However, in all the oceans where it is fished, tuna is under severe pressure from the world's fishing fleets, both legal and illegal. The western stocks of Atlantic bluefin tuna *Thunnus thynnus* and Southern bluefin tuna, *Thunnus maccoyii* are both listed as 'Critically Endangered' on the IUCN list of threatened species. Pacific bluefin tuna *Thunnus orientalis*, a species targeted by the Japanese fishing fleet, has also been overfished due to minimal regulation.

In May 2010, Japanese fisheries scientists became alarmed at the state of the Pacific bluefin stock. New data revealed that over the past few years, boats have begun targeting the Pacific bluefin in their spawning grounds.⁸⁶ This practice increases catches, simultaneously making the stock seem bigger while damaging the species' breeding capacity – a factor not addressed in the stock assessment. The Japanese scientists behind the study believe that the population of mature large Pacific bluefin tuna is now shrinking at such an alarming rate that it may be facing a crisis similar to that faced by the Atlantic and southern bluefin tuna and, if the current practice continues, that the Pacific bluefin stock will collapse before the Atlantic stock. It is not only the Pacific bluefin tuna that is suffering as a result of the large-scale industrial fishery, but many small-scale local fishermen. Among those calling on the Japanese government to protect the waters which are critical to the life history of the Pacific bluefin tuna are the Mayor of Tsushima and the head of fishery cooperative of Oma, the best-known pole and line fishing community in Japan.

The Fisheries Agency of Japan (FAJ) has found it problematic agreeing with the various actors involved in the bluefin fishery a total allowable catch quota for this species that is within precautionary

limits. One of the simplest measures to ensure the effective management of this species would be to close the bluefin spawning grounds and migration routes located in the Sea of Japan to destructive fishing activities, thus protecting the interests of the small-scale coastal fishermen as well as the tuna.

There are clear reasons for the government of Japan to prioritise the protection of the areas important to the life history of the Pacific bluefin tuna in the Sea of Japan for fisheries management reasons, however the creation of a marine reserve in this area is just the first step towards building a comprehensive national network in order to conserve representative habitats and species. Another key area that needs to be included in any future Japanese protected area network is the ecological hotspot near Okinawa that encompasses both coral reef habitat and the seagrass meadows that are utilised by the northernmost population of endangered dugongs. Since 2005 Greenpeace Japan has been actively campaigning with local community groups to stop the construction of a US military base that threatens the dugong's critical habitat.

The establishment of marine reserves is not an entirely new concept in Japan, for the local council in Okayama prefecture has established two marine reserves with the dual purpose of protecting the coastal ecosystem and ensuring the sustainability of the fishery around the reserves. Now the prefecture council and the local fishermen who initiated the establishment of the reserves are benefitting as a result of spill-over of fish from the reserves, and promoting this kind of management nationwide.

This October, Japan plays host to a meeting of the CBD, and as both the host country and an influential voice in the realm of international marine policy, the government of Japan has a responsibility to show leadership and live up to its publicly stated aim to ensure the sustainability of the world's tuna and other resources. In practice what this means is that the Japanese government should announce its support for the creation of a no-take area in the Sea of Japan and work expeditiously towards the creation of a national network of marine reserves as well as support the progressive measures being put

forward to protect the tuna stocks found in the high seas. In particular, Japan should support the initiatives proposed by the Pacific Island Countries to protect the Pacific tuna stocks including supporting the closure of the high seas enclaves at the forthcoming meeting of the West and Central Pacific Fisheries Commission this December. Equally important is for Japan, as a key member of ICCAT (the organisation charged with managing the Atlantic bluefin tuna stocks), to support the immediate closure of the Mediterranean bluefin tuna fishery by

setting a zero bluefin tuna fishing quota until the species has recovered. This fishery should only be reopened when all the bluefin tuna's spawning areas, including the Balearics (see *The Balearic Islands and the Sicilian Channel*, p. 32), have been permanently closed to fishing and a new management plan that meets the scientific advice adopted. By doing these simple things, Japan can demonstrate true leadership among the Asian fishing states and help secure a future for the global fishing industry and achieve international conservation goals.

Fig 7: Map showing the spawning grounds of the Pacific bluefin tuna in the Sea of Japan proposed by Greenpeace as a marine reserve



Japan consumes 25% of the world's tuna and 80% of the world's bluefin tuna

10.2.2. India

A wide variety of ecosystem types, including wetlands, coral reefs, mangroves, islands, lagoons and estuaries, are found along India's coastline, which stretches over 8,000 km. These ecosystems contain a wide diversity of species and provide rich spawning and breeding grounds for fish and other marine organisms. Unsurprisingly, these areas provide a number of important services for India's coastal population, not least for their role in protecting the coast from tidal action, storm surges and freak occurrences such as tsunamis. The crucial importance of these areas was well documented by institutions including UNEP, following the massive tsunami that occurred on 26 December 2004.⁸⁷ Additionally, these play a vital role in acting as a first line of defense against global warming associated sea level rise.

A key feature of India's coast is the large, economically disadvantaged population that depends on fisheries and related activities for primary sustenance and livelihood. A conservative estimate suggests that at least 3.5 million people derive their livelihood directly from marine fisheries in approximately 4,000 fishing villages situated along the Indian coastline. Other estimates put the number of Indians dependent on marine fisheries much higher.⁸⁸ Most of those directly dependent on the fisheries sector are small-scale and artisanal fishworkers and fish traders whose futures depend on healthy oceans and fish populations.

Less than 0.3% of India's waters (including the entire 2 million km² EEZ) are under some form of legal protection, where extraction including fishing is either prohibited or restricted. Even though this percentage is very low, the high level of direct resource dependence coupled with a lack of community consultation has generated resistance towards many of these MPAs and marine reserves. While fishing communities support measures to protect their fish resources, they are adamant that local communities need to be involved in making decisions over which areas need to be protected, how and to what extent. This was clear at a symposium on marine reserves organised by Greenpeace in 2007, where fisher community representatives from across India expressed support for marine reserves that are set up with the prior involvement of communities and which protect marine resources from all threats, including fishing.⁸⁹

Community involvement in designing and enforcing marine reserves in India, particularly in the coastal zone, is indispensable if the reserves are to achieve their objectives. Effective implementation will also be impossible without community support. Greenpeace is campaigning in Orissa on the east coast, to enable the Gahirmatha Marine Sanctuary to become a model for better biodiversity conservation and a tool for fisheries management that successfully addresses potential conflicts between conservation and livelihoods. A successful model in Orissa can serve as a guiding reference for marine conservation in the rest of India.

image Dead turtle on the beach, National Park at Bhitarkanika, Orissa, India. The construction of a new port at Dhamra, coastal development, unsustainable fishing practises and illegal trade are taking their toll on the turtle population.

image Local fishing men and their nets on a beach.

Of course, it is not only the large numbers of traditional fisher-folk that put pressure on India's marine environment; the growth of the mechanised fishing sector over the last two decades has led to high levels of fishing pressure in near-shore coastal waters. Available reports indicate that fisheries resources in several parts of the country are under stress, with most major commercial stocks showing signs of overexploitation.⁹⁰ This has repercussions for millions of livelihoods. With overall fish catches showing a tendency to plateau, and the share of the artisanal fishing sector falling sharply, measures to limit fleet capacity and sustain fish stocks are essential. On the positive side, exploitation of distant waters in the Indian EEZ is believed to be much lower than for most other countries, though there are efforts from government and industry to increase exploitation. It is essential that protection and conservation measures in the whole EEZ are implemented soon, before exploitation levels increase.

As a build up to the 2012 Conference of Parties on the Convention on Biological Diversity scheduled to be in India, the government of India needs to work towards identifying and establishing a national network of fully-protected marine reserves, ensuring the full involvement of traditional fisher communities and other concerned stakeholders. In addition, India should build on its pro-conservation stance demonstrated in many international fora and work much more actively towards achieving a global network of marine reserves on the high seas and effective global oceans governance.



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10.2.3. Chile

Chile's territorial sea and EEZ cover approximately 3,490,175 km² in total and within these waters are a number of islands including the San Felix and San Ambrosio islands, Juan Fernandez, Easter Island and Salas y Gómez. Chile's coastline measures some 4,200 km in length, but if the coastlines of the islands located in Chilean waters are included, the total reaches 83,850 km.

According to the 2010 census on fishing conducted by the National Statistics Institute INE, there are 71,880 fishermen and related workers involved in the fishing industry.⁹¹ So it is fair to say that Chile is a country that has a strong 'fishing culture'.

Some of Chile's leading scientists have studied the country's marine biodiversity and have come to the conclusion that the loss of marine biodiversity in the seas around Chile can be attributed to (a) the modification, fragmentation and loss natural habitat, (b) the introduction of alien species, (c) the over-exploitation of species, (d) marine pollution, and (e) the use of destructive fishing gear.⁹² Other studies show that the main threat to Chilean marine ecosystems and fisheries comes from the trawl industry and its associated bycatch. This wasteful and destructive fishing method not only results in the unnecessary loss of many species but also has significant detrimental consequences for the many artisanal fishermen who make their living by targeting species that constitute a major part of the trawlers' bycatch.⁹³

The government of Chile has established some MPAs in Chilean waters but the total coverage falls far below what is recommended or indeed what Chile has committed to establish under the CBD. Chile's territorial sea covers 120,827 km² while the area designated in order to conserve and protect biodiversity totals a mere 98,263 km². With only 0.81% of its coastal waters and none of its offshore waters protected, Chile is failing to give its marine environment the protection it deserves, despite the fact that many vulnerable marine ecosystems have been identified in its waters.

In order to assist the government of Chile in its efforts to meet its international commitment under the CBD, Greenpeace Chile, together with representatives of

Chile's traditional fishermen, has developed a proposal for a national network of marine reserves covering 10% of each of the five eco-regions in Chile's EEZ. It is Greenpeace's hope that the Chilean government will work with the fishermen and other key stakeholders towards the designation of the areas identified in the proposal and enact the necessary legislation to ensure that they are officially protected by the 2012 deadline.

Chile has an influential voice in various international fora where important decisions about fisheries and oceans governance are made and is in a position to help ensure that marine protection and conservation are of primary concern within these bodies.

Fig 8: Greenpeace proposal for a national network of marine reserves in Chilean waters



10.2.4. Brazil

Brazil is considered to be the country with the greatest biodiversity on the planet. While much of this richness resides in the Amazon, the Atlantic forest and other terrestrial eco-regions, the value of its coastal and marine zones should not be underestimated.⁹⁴

Brazil has one of the longest coastlines in the world, extending over 7,400 km between the mouth of the Oiapoque river in the north and that of the Chuí river in the south. Bathed by warm waters in the northeast and north and colder waters in the southeast and south, the Brazilian coast supports a wide variety of ecosystems including mangroves, coral reefs, dunes, *restingas* (coastal scrub), sandy beaches, exposed rocky coastlines, lagoons and estuaries, with numerous species of animals and plants, many of which are endemic and some threatened with extinction.^{95,96}

One of the richest marine areas is the Abrolhos Bank. It is the only place where all species of the Brazilian coral reef fauna occur. The four large coral groups – rocky corals, fire corals, octocorals, and black corals – are all represented and two species *Mussismilia brasiliensis* and *Favia leptophylla* are endemic to the state of Bahia.

Of the 43 species of cetacean that have been recorded in the Brazilian EEZ, the conservation status of four is of great concern, namely the right whale (*Eubalaena australis*), the humpback whale (*Megaptera navaeangliae*), the franciscana or La Plata dolphin (*Pontoporia blainvillei*), and the tucuxi dolphin (*Sotalia fluviatilis*). The marine manatee (*Trichechus manatus*) is the most threatened marine mammal in Brazil, with isolated residual populations distributed from Alagoas to Amapá, totaling at most a few hundred individuals.⁹⁷

In keeping with its commitments under the CBD, the Brazilian government has prepared a National Protected Areas Plan (PNAP), which takes into consideration the marine and coastal environment. As it currently stands, a meager 0.4% of Brazilian waters are either designated as a MPA or marine reserve, despite the known high biological value of many areas. As is the case elsewhere, Brazil's waters are already under considerable stress from overfishing, pollution, climate change and offshore oil drilling. With the recent discovery of new oil reserves within the Brazilian EEZ, some of Brazil's most important marine areas are under threat.

To help develop an effective marine management regime, Greenpeace has been working to identify all the hot spots and areas important to marine biodiversity present in the Brazilian EEZ. By also mapping the blocks that have been made available for oil exploration and production, Greenpeace has been able to show the areas of overlap.

While oil drilling will contribute to further habitat degradation and climate change through the emissions of CO₂ resulting from burning the oil, creating marine reserves to protect the coastal ecosystems will bolster climate change mitigation and adaptation strategies. Recent studies underscore the importance, in particular, of coastal habitats in acting as a natural carbon sinks. A 2009 report estimates that carbon emissions – equal to half the annual emissions of the global transport sector – are being captured and stored by marine ecosystems such as mangroves, salt marshes and seagrasses.⁹⁸

Continually increasing CO₂ and other greenhouse gas emissions are contributing to climate change while, at the same time, natural ecosystems are being degraded, reducing their natural ability to absorb CO₂. Globally, this loss of capacity is equivalent to between one and two times the annual emissions from the entire global transport sector.⁹⁹

The Brazilian government has already taken some major steps forward to protect Brazil's forests. Now it needs to care for the coasts and oceans and establish a national and ecologically coherent network of marine reserves.

10.2.5. Bering canyons

In the US, Greenpeace has also been working to establish marine reserves to protect the largest underwater canyons on earth, in Alaska's Bering Sea. More than 4 billion pounds of groundfish – Pacific cod, pollock, and Atka mackerel – are harvested each year in the Bering Sea, Gulf of Alaska, and Bering Islands and depletion of pollock and other fish from critical habitat areas by bottom trawler fishing may be responsible for the precipitous decline of the Steller sea lion that began in the 1980s.¹⁰⁰ Using manned submersibles and an ROV to explore these areas for the first time, Greenpeace collected data documenting numerous species of deep sea corals and sponges not previously known to live in the Bering Sea. The expedition also discovered one species of sponge that was new to science.¹⁰¹

The data from the expedition has now been analysed, and a paper will be submitted for publication in a scientific journal shortly. Preliminary findings were presented at the 2010 annual meeting of the Society for Conservation Biology in Edmonton. Publication of the findings in a peer-reviewed journal, together with the support of key tribal stakeholders, puts Greenpeace in the position to formally petition for closure of these areas in late 2010.

10.2.6. North and Baltic Seas

Greenpeace's campaign for a global network of marine reserves began in earnest in 2004 with the launch of a proposal for a network of marine reserves covering 40% of the North and Baltic Seas.¹⁰² Most of the countries that have coasts bordering the North and Baltic Seas are members of the EU and consequently the regulation of activities within the country EEZs is determined at the EU level.

In addition to their international commitments, all EU Member States are bound by law to establish a representative and well-managed network of protected areas, including areas of the marine environment. They are also bound to achieve a good environmental status in all marine areas by the year 2020. These obligations arise principally from three separate, but interlinked, EU Directives, the 1979 Birds Directive, the 1992 Habitats Directive and the 2008 Marine Strategy Directive.^{103,104,105}

Sites protected under the Habitats Directive, together with sites protected under the Birds Directive, form the EU Natura 2000 network. Under the general provisions of these Directives, Member States must maintain or restore the site/species/habitat at/to a 'favourable conservation status', and prevent any deterioration of that status and also take appropriate steps to avoid the disturbance of the species for which the areas have been designated, in so far as such disturbance could be significant in relation to the Directives' objectives. In theory, the North and Baltic Seas and other European waters should be reasonably well protected, but this is not the case.

Although there are many designated Natura 2000 sites in European waters, most of these are very small and have few restrictions on the activities that take place within their boundaries. For example, bottom trawling is still permitted in the Sylt Outer Reef in German waters and Fladen and Lilla Middelgrund in Swedish waters even when this activity is known to cause damage to the habitats and species for which these areas were designated. The crux of the problem lies with the lack of

integrated ocean management in the EU and the consequent conflicts between environment and the management of fisheries and other activities. In 2012, the EU's Common Fisheries Policy will be revised, presenting an opportunity to reform the relevant legislation and ensure that EU countries implement appropriate measures to regulate the activities that take place in marine reserves and MPAs.

Fig 9: Greenpeace proposal for a network of marine reserves for the North and Baltic Seas



- 1 Viking Bank
- 2 Cromarty
- 3 Norwegian Trench
- 4 Dogger ban
- 5 Great Wadden Sea

- 6 Skagerrak
- 7 Kattegat
- 8 German east coast
- 9 Baltic proper inc. Bornholm deep
- 10 The Archipelago

- 11 The Quark
- 12 North Bothnia Bay
- 13 Gulf of Finland
- 14 Gulf of Riga
- 15 Kaliningrad

The way forward



Our oceans are in crisis. For centuries, the waters covering 70% of our planet have been plundered of fish, choked with pollution and warmed with climate change causing emissions. Given the state of the world's oceans, the poor rate of progress toward creating a global network of marine reserves – a necessary step to restore our oceans to health – is more than disappointing. Although there have been some positive moves taken since the publication of Greenpeace's *Roadmap to Recovery*, they are nowhere near the scale of effort that is needed to arrest the ongoing deterioration of ocean ecosystems. Without robust action to identify and implement networks of marine reserves at both the national and regional scales, our oceans and the millions of people who depend on them will suffer impacts from which they may never recover. The failure to protect the oceans is largely due to a lack of political will to act on existing commitments and channel the necessary resources towards oceans protection. Sadly, world governments still lack a real sense of urgency about the extent of the oceans crisis despite the numerous warnings of scientists. The many unknowns surrounding the complexities and functions of marine ecosystems – often used as a pretext for lack of progress in marine conservation – must no longer hinder action.

The negotiations toward a new Strategic Plan for the CBD will set goals and targets for 2011-2020. This global plan for life on earth will provide governments with a unique opportunity at a time of global crisis to focus action on reducing key threats to biodiversity and ensure sustainability and greater protection of ecosystems. With so many ecosystems on the point of collapse if radical action is not taken, it is important that governments agree ambitious targets to prevent biodiversity loss. For the marine environment, governments must agree a target that reduces global fishing capacity, estimated to be at least 2.5 times higher than the sustainable level, as well as ensure destructive and unsustainable fishing practices are eliminated. An ambitious target for marine protection should be adopted, prioritising the high seas in a global network of protected areas. There must be a commitment to eliminate unnecessary fishing subsidies, directing this money instead to sustainable practices and conservation.

The case studies presented in this report demonstrate clearly that sufficient information is currently available to apply the principles and criteria agreed under the CBD and to identify and create networks of marine protected areas in the oceans and seas around the world.

The development of a global database of ecologically or biologically significant areas in marine areas beyond national jurisdiction (CBD EBSAs) and other areas such as the FAO vulnerable marine ecosystems (VMEs) must be agreed by governments at the CBD COP10 in Japan. Together with the sharing of scientific data, methods, experiences and lessons learned, this will greatly facilitate the process of selecting sites for a global network of marine reserves.

Most countries have sufficient legislation to enable the establishment of marine reserves within their national waters. As the Mediterranean and Pacific case studies illustrate, the situation with regards to ocean conservation differs varies greatly between different high seas areas and the provisions are at best piecemeal. In the short term, it is crucial that existing bodies cooperate and coordinate activities and that existing arrangements are harmonised to ensure that significant progress is made towards achieving agreed conservation objectives. While in some areas such as the Mediterranean or the North Atlantic, the various existing political mechanisms for oceans protection could cooperate to designate areas, in other areas there is no framework for doing this.

The reality today is that for the majority of the high seas, no clear mechanism under UN Convention on the Law of the Sea Convention (UNCLOS) and the CBD has been put in place for implementing marine reserves on the high seas. Without such a mechanism, our oceans: the ecosystems, species and genetic diversity beyond national jurisdiction are exploited by all, protected by none.

Set up under the auspices of the United Nations General Assembly (UNGA) to study issues relating to the conservation and sustainable use of marine biological diversity beyond areas of national jurisdiction, both the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea (UNICPLOS) and the Ad Hoc Open-ended Informal Working Group have been exploring different options and approaches for increasing international cooperation and coordination to save our oceans. In order to move forward, and in addition to the work being carried out through existing agreements, countries must support the continuation of these discussions within the UN and set up a formal process to develop an agreement which addresses the current gaps in high seas governance and includes a mechanism for establishing marine protected areas and marine reserves in areas beyond national jurisdiction.

One possible solution which has been put forward for discussion, and one that is supported by Greenpeace, is to develop a new implementing agreement for the conservation and management of the marine ecosystem in areas beyond national jurisdiction under the UNCLOS.

To help further these discussions, Greenpeace has drafted some model text which fully enshrines the precautionary principle and would provide the means for ecosystem-based management of the high seas.¹⁰⁶ In line with best current practice, the new agreement would ensure the use of the best available scientific information and be founded on the recognised principles of good environmental governance such as access to information, transparency and public participation. Its overarching aim would be to ensure the long-term conservation and sustainable management of marine life, ecosystems and biological diversity, the protection and preservation of the marine environment, the fair and equitable sharing of the benefits arising out of the utilisation of marine genetic resources in areas beyond national jurisdiction and the effective implementation of all the relevant provisions of the Law of the Sea. It would also provide a universal framework for new, emerging and intensifying uses and activities in areas beyond national jurisdiction and establish the necessary institutional arrangements to implement an effective international monitoring, control, surveillance, compliance and enforcement regime. Lastly, to address the current gaps and fragmentation in oceans governance on the high seas, the new implementing agreement would further enable the creation of regional oceans management organisations.

Governments have pledged to establish a global network of marine protected areas by 2012. Today less than 1% of the world's oceans are fully protected. Time is running out to secure the future of our oceans and the millions of people that depend on them.

Greenpeace is calling on governments to act now to put in motion a recovery plan for the world's oceans and implement a global network of marine reserves.

Specifically Greenpeace calls on governments to:

- **expedite the long-term implementation of a global network of marine reserves covering 40% of the world's oceans, within and beyond national jurisdiction;**
- **agree to a target at the CBD COP10 in Nagoya that would protect 20% of marine areas, especially those of particular importance for biodiversity and ecosystem services by 2020;**
- **develop a global database of ecologically or biologically significant areas in marine areas beyond national jurisdiction and other areas such as vulnerable marine ecosystems;**
- **support and advance negotiations for the adoption of a new implementing agreement for the conservation and management of the marine ecosystem in areas beyond national jurisdiction under the LOSC, which addresses the current gaps in high seas governance, including a mechanism for establishing marine reserves in areas beyond national jurisdiction;**
- **until the adoption of such an agreement, promote the adoption by all relevant bodies and agreements of a set of principles to guide the management of human activity and conservation of biological diversity beyond national jurisdiction, including the requirement to carry out environmental impact assessments, including the assessment of cumulative impacts, among others;**
- **agree to targets at the CBD that put an end to overfishing and the use of destructive fishing practices by 2020 at the latest to allow the recovery of marine ecosystems.**

image Dried fish for sale at South Korea's largest seafood market Jagalchi.

image Fishermen use pole and line fishing method to catch skipjack tuna. Pole and line fishing is a selective and therefore more sustainable way to catch tuna as only fish of a certain size are caught, leaving juveniles to grow to spawning age and replenish the stock in the future.

image Soft corals, a school of french grunts (*Haemulon flavolineatum*), and blue chromis (*Chromis cyanea*) near Looe Key north of Key West.

Our oceans belong to us all, providing humankind with food and over half the oxygen we breathe, driving the weather systems and natural flows of energy and nutrients around the world, in short our oceans keep the Earth habitable. The failure to protect our oceans is a failure for the entire planet. Now is the time for our leaders to reverse the centuries of destruction and take bold action to defend our oceans and ensure that future generations can depend on them. The year 2012 is

not only the deadline for meeting the CBD targets, but also marks the 20th Anniversary of the Rio Earth Summit and the 30th Anniversary of the adoption of the LOSC. In this, the International Year of Biodiversity, governments must live up to their promises. This year world leaders must make the most of the political opportunities given to them, act for the long-term interests of the world and put our oceans on the road to recovery.



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