



MARINE NEWS

IUCN GLOBAL MARINE AND POLAR PROGRAMME

ISSUE 13 - SEPTEMBER 2016



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Issue 13 -September 2016

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Back issues available at:
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Front cover: © William Winram "The Woman and the Sea" - Freediver Andrea Asunsolo in the company of tens of thousands jack fish in the Cabo Pulmo marine preserve (Mexico).

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Centre spread (Photo competition)

Top row - left to right
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David Higgins, Sean Chinn, Christine Shepard, Steve De Neef, Sean Chinn

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Reasons for Hope

By Dr. Sylvia A. Earle
Founder of Mission Blue and National Geographic Society Explorer-in-Residence

As thousands gather in Honolulu, Hawaii in September for IUCN's World Conservation Congress, there are plenty of reasons for despair about the declining state of the natural world and the influence its degradation is having on all people, everywhere.

The headlines are grim, whether the topic is global warming, deadly diseases, profound poverty, or the steep decline of wildlife, from orangutans to elephants, crocodiles to corals. Despite efforts of caring people globally, since the founding of IUCN in 1948, about half of the coral reefs, kelp forests, mangroves and sea grass meadows are gone, and ocean phytoplankton has declined by nearly as much. In a trajectory similar to the decline of songbirds, raptors, waterfowl and whales early in the 20th century, the early 21st century marks a time when 90 percent of many fish species have been extracted from Earth's aquatic realms: large sharks, groupers, snappers, halibut, cod, wild salmon and even brightly-colored reef fish such as parrotfish and blue-green, giant-lipped Napoleon wrasse that look and behave like Cirque du Soleil performers.

So, why do I tell children they are the luckiest people ever to arrive on Earth?

There are plenty of reasons for optimism and hope, starting with technologies that have made possible unprecedented discoveries about our place within the planet that sustains us. For the first time, it is possible to measure, document and communicate the powerful impacts humans are having in ways we could not even a few decades ago. We can map the boundaries of our life support system and understand why protecting nature is neither a luxury nor even an option – it is critical to our survival. Now we know.

As the Congress is taking place on an island embraced by Earth's largest, deepest, oldest body of water, the Pacific Ocean, it is appropriate that the meetings will focus significant attention on the blue part of the planet. Below the upper, sunlit surface,



Editorial

much of the ocean remains unknown, unexplored. But we have discovered enough to understand that the ocean governs everything from climate and weather, to planetary chemistry – generating oxygen, taking up and holding carbon. Like all other living things, we are essentially sea creatures, connected to the ocean with every breath, and every drop of water we drink. The value of the ocean can no longer be measured in tons of fish, barrels of oil and minerals, or as a place to dump waste. Now we know: The most important thing we extract from the ocean is our existence. The most important thing we can put into it are protective policies that yield a healthy ocean and an enduring future for ourselves and that which we hold dear.

Since the mid 1980s, nations with a coastline have enjoyed jurisdiction over vast new areas, the Exclusive Economic Zone (EEZ) extending 200 nautical miles seaward from their shores. Coastal nations have enhanced opportunities – and heightened responsibilities – to boldly embrace their blue borders, and individuals in all nations have a vested interest in the High Seas beyond national jurisdiction, about half of the world in total.

A century ago, the U.S. National Park Service was founded to safeguard the nation's natural, historic and cultural heritage – an idea whose time had come, as evidenced by the thousands of parks that have been subsequently established globally. About 14 percent of Earth's terrestrial forests, deserts, meadows and mountains have been safeguarded since then, but the concept of "Blue Parks" has been slower to take hold. Presently, only two percent of the ocean has been officially safeguarded for fish and other wildlife. Some say restoring and protecting the ocean requires extending this protection to at least 30 percent. The highly respected ecologist, E. O. Wilson, makes the case for protecting at least half of the world to stabilize biodiversity loss and protect Earth's basic life support functions.

The World Conservation Congress could mark a turning point, a shift from a long history of consuming Earth's living assets to a new era of caring for nature as if our lives depend on it – because they do.

IUCN's Marine & Polar Activity

Contributing toward the Sustainable Development Goals

Reflecting IUCN's aim to contribute to the delivery of the Sustainable Development Goals and the Paris Agreement on Climate Change in the roll out of its programme of work for 2017-2020, it is important to recognise how IUCN's marine and polar activities around the world contribute to these outcomes now and into future. Doing so guides conservation action and aligns it with international priorities, many of which have been integrated by IUCN's donor community. It also reinforces the often-under-estimated role of living marine resources and ecosystems in preserving the livelihoods and

food sources of coastal communities whilst protecting them from harm.

The exercise of matching activities with SDGs is difficult to complete accurately and exhaustively given the wide inter-connectivity between human well-being and the environment. Nearly all SDGs lead one way or another to a need to maintain the health and vitality of the oceans, which play such an important role in so many aspects of human life.

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UN Sustainable Development Goal	IUCN Marine & Polar Activity
2 - Zero Hunger: End Hunger, achieve food security and improved nutrition and promote sustainable agriculture	Aquaculture has the potential to feed millions of people around the world and potentially reduce the pressure on wild fish stocks. IUCN has worked for many years on the sustainability of aquaculture and, more recently with the aquaculture and feed sectors looking at the sustainability of the fish feed supplying the industry and at the synergies between aquaculture and marine protected areas.
3 - Good Health and Well-being: Ensure healthy lives and promote well-being for all at all ages	IUCN GMPP is looking at the potential health implications of marine microplastics on fish and seafood as well as the role Marine Protected Areas can play in safeguarding human health.
13 - Climate Action: Take urgent action to combat climate change and its impacts	IUCN GMPP and WCPA Marine have published a series of scientific publications on climate change in the oceans; the role of coastal ecosystems and the open ocean in the carbon cycle and on identifying how ocean warming affects different species and ecosystems.
14 - Life Below Water	
14.1 - By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution	As part of its <i>Closing the Tap on Marine Plastics</i> project, IUCN GMPP is working with a broad range of stakeholders, including industry, to explore ways to effectively reduce the amount of plastic entering the ocean.
14.2 - By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans	In partnership with USAID and the IUCN Asia Regional Office, IUCN GMPP is implementing a major project to build knowledge and capacity in the Maldives to enhance the resilience of coastal ecosystems and the communities that depend on them.

14.2 (continued)	As part of its portfolio of projects in EU Overseas territories, IUCN has awarded grants to restore ecosystem Services and Coral reef quality in four Caribbean island systems and is financing the establishment of inter-connected Marine Protected Areas in four island states in the Pacific. IUCN has also worked to ensure protection of the unique resources of the Sargasso Sea and establish MPA networks in the Mediterranean.
14.3 Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels	IUCN GMPP and WCPA Marine continue to host the International Reference User Group on Ocean Acidification, a group of leading scientists in this field, with the aim of compiling and communicating the latest scientific findings in order to positively influence international policy and decision-making.
14.4 By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics	IUCN and WCPA is actively trying to influence States to work towards sustainable management of high seas fisheries. We are going about this at global level through participation in UN governance processes and at regional level through the governance component of Southern Indian Ocean seamounts project, funded by FFEM. IUCN has cooperated with the Southern Indian Ocean Deep-sea Fishers Association to put in place voluntary closures in highly sensitive areas for marine biodiversity.
14.5 By 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on the best available scientific information	IUCN and WCPA have consistently advocated for expanding ocean areas under protection so that the ocean has the capacity to recover from multiple and cumulative stresses. In partnership with IUCN's Oceania Regional Office, IUCN GMPP worked to assist the initial implementation phase of the Cook Island Marine Park. And in partnership with Mission Blue, IUCN aims to bring much-needed protection to uniquely valuable biodiversity-rich areas of the ocean realm.
14.a Increase scientific knowledge, develop research capacity and transfer marine technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries	Through its portfolio of projects centred on the Maldives, IUCN GMPP has worked to increase knowledge of local ecosystems and megafauna through intensive surveying in partnership with local practitioners. As a result, valuable information on coral bleaching and recovery has been compiled leading to an enhanced capacity to respond to coral bleaching episodes as seen in 2016.
14.c Enhance the conservation and sustainable use of oceans and their resources by implementing international law as reflected in UNCLOS, which provides the legal framework for the conservation and sustainable use of oceans and their resources, as recalled in paragraph 158 of <i>The Future We Want</i>	IUCN GMPP and WCPA are striving to achieve positive global outcomes for marine biodiversity through participation in the discussions on the setting up of an <i>Implementing Agreement</i> for management of high seas resources, a process that is likely to run for several years starting in 2016. A key component of this drive for sustainability is the safeguard of deep sea ecosystems from likely irreversible harm from future deep sea mining operations. IUCN is an active observer to the proceedings of the International Seabed Authority.

Closing the Plastic Tap: Stakeholders Meet in Monaco

Plastic waste in the ocean is becoming an increasingly prevalent problem in all marine environments. Our oceans are quickly becoming saturated with plastic. Ever-increasing production and consumption of single-use plastic is paired with inadequate waste management in many countries and regions, frequently leading to entry of plastic material into the ocean. Once there, it becomes infinitely more difficult to remove and poses an immediate and persistent risk to marine animals and habitats.

Floating plastics have now become the most abundant type of marine litter. Slowly degrading large plastic items generate microplastic particles (between 1-5mm in diameter), which can be transported over long distances by wind-driven ocean surface layer circulation. Microplastics can also originate from personal care products (plastic beads used for cleaning purposes, less than 1 mm across) that are washed down the drain and pass through treatment filters in wastewater plants.

IUCN has been working on microplastics since 2011, and is currently conducting expanded field research. The Union works with a coalition of private sector, governments and NGOs to discuss and develop best practice solutions to address plastic and microplastic marine pollution.

Monaco Meeting

IUCN's Global Marine and Polar Programme believes that the most effective and long-lasting solutions are those that are borne of collaborative effort. An ongoing partnership with the Swedish Postcode Lottery Foundation has sought to bring together relevant stakeholders to design and implement long-term solutions to the growing problem of plastic pollution in the Mediterranean Sea.

This meeting followed up on the inaugural meeting in November 2015, where participants identified key priority areas for short- and long-term action. The short-term priorities inform the "2017 Action Plan", which in turn informs the "2025 Target for Solutions on Marine Plastic Litter". The proposed actions were broken into five sub-groups differentiated by their target: businesses, research facilities, NGOs, governments, and cross-sector, multi-stakeholder platforms.

Suggested actions included mandatory disclosure of companies' annual plastic footprints; incorporating plastic content as a chemical and physical indicator in assessing water quality; rolling out widespread education and awareness campaigns; banning single-use plastics (or making their pricing prohibitive); and cre-

ating links between product designers and waste managers. An important strategy mentioned by many participants was emphasising the impacts on human health.

Tracing the Origins of Marine Plastics

At the 2016 IUCN Congress, the Global Marine and Polar Programme will release a report developed by Swiss-based consulting company, "Shaping Environmental Action". This report will model the sources and pathways of marine plastics, examining global plastics production, mapping key contributors for waste generation, mapping waste hotspots and



modelling areas and industries subject to "leakage". This report will help stakeholders to plan targeted, efficient interventions in order to have the largest possible impact on mitigating this problem.

A range of further proposals are currently in development, including a Plastic Platform for Oceania in partnership with the Australian Ministry of the Environment, and a Baltic Sea Project for Marine Litter focusing on biodiversity, human health and climate change. The second phase of the Azores Project is also in motion, targeting plastic content in commercial fish species.

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Assessing the Effects of Microplastics in the Arctic

© Will Ng

Though many consider the Arctic to be one of the last pristine environments on Earth, the Arctic Ocean is already heavily affected by the trillions of pieces of plastic floating in our world's oceans today.

The Arctic is known to be a sink for pollutants including mercury, Persistent Organic Pollutants (POPs) and atmospheric carbon particulates. An additional dangerous pollutant – microplastic – has now reportedly reached the region. The microplastic concentrations found in Arctic Sea ice far exceed even those previously reported in highly contaminated oceanic waters (plastic gyres) in the North Pacific. Some studies claim that a sixth "plastic garbage patch" is forming in the Barents Sea.

Plastic has the capacity to attract contaminants, including POPs, and transport toxic chemicals into otherwise clean environments. Invasive species are transported in much the same way. It is also assumed that the plastic is hampering the formation of ice floes and causing them to melt faster. The Arctic is already suffering from multiple serious stresses induced by climate change, black carbon and marine acidification.

The discovery of marine litter and its potentially hazardous effects on ecosystems and human health underlines the urgent need for comprehensive research and monitoring, as well as the development and implementation of a sustainable waste policy and legislation to mitigate the problem of microplastics.

Arctic plastic pollution presents a serious human health concern; approximately 40% of the United States' commercial fisheries (by weight) come from the Bering Sea, and about 50% of the fish consumed in the European Union comes from the European Arctic. Microplastic pollution in the Arctic and its effects on ecosystems, human health and ice formation and melting are the subject of a newly launched IUCN research project. The pioneering project aims to assess the origins of microplastics and the effects of plastic ingestion on marine life as well as food safety consequences for humans.

It will also analyse the physical and chemical impacts of microplastics in Arctic sea ice, including how it may affect formation and melting of ice. With this information in hand, IUCN will provide recommendations to governments, industries, local communities and civil society to design mitigation solutions. IUCN will be studying the impact of plastic pollutants on climate change and arctic ecosystems, teaming up with the Korean Government and Korea Polar Research Institute (KOPRI) to conduct a full-scale scientific study of this issue. KOPRI is providing technical expertise and access to their research vessel, Araon, the largest research icebreaker in the world. The project has also been endorsed by the GESAMP (UN Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection).

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The project is divided into three research streams:

- I. Quantitative and qualitative analysis of microplastics in the Arctic and study of their origin(s)
- II. Food sustainability, human health and microplastics (focusing on fisheries and food contamination)
- III. Effects of microplastics on the formation and melting of ice and, subsequently, as a climate change feedback mechanism.



Marine Mammals and Ocean Warming

© Steve Dawson

Ocean warming is now acknowledged as crucially important to marine mammal life. Ocean temperatures affect both the availability of prey and the distribution of mammal populations. Along with other climate change-induced stresses, ocean warming is beginning to affect marine mammal populations and behaviour. These developments follow calls from the International Whaling Commission (IWC) to improve our understanding of relationships between climate indices and marine mammal distributions, with particular focus on those with restricted habitats – ice, bays, coves, ocean basins and seas – that prevent them from ‘escaping’ local climate effects. Most whale species migrate across large distances, placing them at particular risk from changes across the multiple environments they encounter during migration.

In September 2016, IUCN will release the landmark Ocean Warming Report, edited by Dan Laffoley and John Baxter. The report assesses the scale of the challenge and explores the issue from a range of different perspectives – oceanography, ecosystems and different groups of species. It also looks at the effects ocean warming might have on the goods and services that humans derive from the ocean.

Marine Mammals at Risk

Marine mammals’ size and pivotal position within food webs makes them ecologically important and a significant conservation concern. Almost a quarter of species are threatened with extinction, including subspecies of blue whale, right whale, river dolphin and beluga whale. The narwhal, adapted to an Arctic pack-ice habitat, is particularly vulnerable to warming effects. Rapid changes in Arctic environments are also placing the beluga and bowhead whales at risk, as well as the walrus, the polar bear and several seal species. Most Arctic regions have seen periods of reduced ice cover during the summer months lengthen by 5-10

weeks since the late 1970s. Larger stretches of open water are making oil and gas prospecting increasingly attractive, raising concerns about human-induced underwater sound waves, habitat reduction and oil spills. Since many of these species are still recovering from previous over-exploitation, the effects are difficult to measure.

Since the mid-1980s, fin and humpback whales have been arriving progressively earlier at their feeding grounds in Canadian waters, by more than one day a year on average. This has been linked to earlier ice break-up in the summer and rising sea surface temperatures. The Norwegian Sea, a migration corridor for

minke whales, has seen reduced population numbers as food sources (krill and amphipods) move north. In the Mediterranean, increased disease vectors, vulnerable plankton populations and toxic algal blooms are a major concern.

Global Consequences

The observed effects of warming include changes in migration patterns, increased mortality rates and changes in reproduction, and movement in populations towards the poles. Associated effects of climate change (including the retreat of Arctic ice) are expected to increase tropical species’ ability to expand into colder regions. Evidence suggests this is already

occurring. Initially, some species may benefit from increased temperatures by expanding their optimal habitats, while reductions in habitats for specialised species may be relatively modest. Ice-dependent species and others with restricted (and shrinking) habitats, such as river dolphins, beaked whales and species living in enclosed areas, remain highly vulnerable.

Changes in human behaviour resulting from climate impacts, however, are vitally important. Food insecurity may prompt greater reliance on marine species and further depletion of marine mammal prey. Further, warming in high latitude waters may drive increased aquaculture, linked with culling of marine mammals and algal blooms. Increased construction activity in coastal areas, rivers and estuaries – possibly for flood protection or to respond to changing weather patterns – may cause fragmentation and habitat destruction among freshwater species.

Species Survey

Freshwater species are particularly vulnerable to habitat reduction, and exposed to dramatic changes in rainfall patterns and violent weather events caused by warming

oceans. Current recommendations point towards measuring and managing tidal height and flux. Suggested conservation measures include restrictions on fishing and encouragement of responsible tourism to capture species’ economic value.

Whale populations are expected to shift in response to prey distributions and ocean temperatures. Black Sea and Mediterranean species may be unable to find appropriate habitat further north, and migratory species may be especially vulnerable, given their need to find particular conditions at specific times. Deep-diving beaked whales are dependent on underwater canyons, a restricted habitat subject to changes in temperature and circulation patterns.

The population recovery rate of the critically endangered North Atlantic right whale is being driven by changes in prey availability linked to climate change. Mismatches between arrival times and prey availability could prompt population crashes, while disruption of environmental triggers for migration and reproduction may drive further

changes. Understanding these relationships will be critical for developing effective ecosystem-based management. Arctic marine mammals (and, to an extent, those in the Southern Ocean) face various other threats: loss of ice-edge habitats and prey; entrapment in sea ice due to rapid, atypical shifts in conditions; competition with species moving into ice-free waters; and increased interaction with human activity. Responses must be flexible and adaptable, monitoring of Arctic marine mammals must improve, and effective, accurate reporting to the public must be accompanied by adequate protective legislation. Warm water herbivores (primarily manatees and dugongs) face somewhat different challenges, but their vulnerability to loss of feeding areas is already evident in Australia. The seagrass on which they feed is exposed to the effects of sea-level rise and decreased light penetration resulting from more regular storms and algal blooms.

Adapted from chapter by Mark P. Simmonds (University of Bristol). For more information, please contact Dan Laffoley (danlaffoley@btinternet.com).

Looking forward

Ocean warming is predicted to reduce the habitats of some marine mammals, particularly those living in vulnerable ecosystems. Habitats most at risk include riverine systems, sea-ice, shelf waters and deep sea trenches. Rising ocean temperatures may combine with continuous exposure to chemical pollution and disease to produce sudden, sharp declines in marine mammal populations. Even if greenhouse gas emissions fall sharply, ocean warming will continue for some time, accompanied by dramatic environmental change.

Rapid changes in marine mammal populations are likely to challenge conventional methods in marine conservation. Many marine mammal populations remain poorly understood, however, partly due to the expense of monitoring and trade-offs with other conservation projects, though drones and acoustic devices may present cost-effective alternatives. Improving the resilience of marine mammals to the threats climate change poses to habitats, mortality and reproduction will require adaptable and responsive conservation tools.



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Ocean Warming and Global Change: Jellyfish

© Fredski2013

Warming and Jellyfish

There are more than 1000 species of jellyfish worldwide. Reports of large concentrations of jellyfish in one place – or ‘blooms’ – are on the rise. Climate change and overfishing are good candidates as primary global drivers of this phenomenon, while localised eutrophication also plays a role. The evidence suggests that ocean warming is driving some species of jellyfish towards the poles as temperate regions become more tropical. Temperature rises are also thought to lengthen the reproductive life of temperate jellyfish and improve winter survival rates of tropical species. The warming of waters below surface level increases the space available for species to flourish, encouraging large populations. Opportunistic species able to reproduce asexually, such as jellyfish, have an advantage over species requiring more predictable environmental conditions to reproduce effectively.

Ocean warming at higher latitudes (towards the poles) may prove harmful for the reproduction of native species, leading to local extinctions, but has not yet been seen to encourage the proliferation of non-indigenous species. Tropical and sub-polar regions are expected to see stable jellyfish populations, whereas temperate regions may see increasingly frequent jellyfish blooms. In turn, larger jellyfish populations can present difficulties for human activity in coastal areas and significant increases in mortality in both fin-fish aquaculture facilities and wild fish populations. The risk of jellyfish stings in the Mediterranean poses a health hazard and risks significant economic losses for maritime tourism.

Temperature, amongst other factors, influences the metabolic rate of jellyfish, and for some species, their respiration rate as well – though in the latter case, significant knowledge gaps remain. Higher temperatures are also associated with faster food ingestion and more rapid growth. Some species have wider tolerances than others to temperature change, though temperatures beyond this range would, in most cases, result in mass mortality.

The Mediterranean Story

Mediterranean jellyfish typically experience temperatures between 12-28°C, potentially stretching to extremes of 4°C and 30°C in particularly variable years. Jellyfish are able to survive these extremes due to the possibility of polyp formation and changes in phenology. Temperatures in the Mediterranean Sea have risen sharply since the mid-1980s, driving mass mortality and severe distress among cold-water species, and the establishment and flourishing of hundreds of tropical species. The increasing abundance of tropical jellyfish in the area exemplifies this trend. Long-term studies demonstrate increasing frequency and size of jellyfish blooms since at least 2009. While formal studies are scarce, these increases suggest they are able to take advantage of higher temperatures. *Drymonema dalmatinum*, a medusivorous (jellyfish-eating) species of jellyfish, has returned to the area after several decades of no sightings, probably due to the proliferation of food sources in the form of other jellyfish.

Evidence that *Aurelia* and *Cyanea* species are best

suited to low temperatures in the North Sea warns, however, that not all jellyfish respond well to warmer temperatures. Polar species that thrive in cold waters are expected to suffer, but research in polar regions is particularly sparse and some studies report no effect of increased temperatures in some areas, like *Aurelia aurita* in the Baltic Sea. In warmer waters, increased temperatures may also drive population increases through increased winter survival rates and the prolonging of the reproductive period.

Consequences

The precise impact of jellyfish blooms depend on the role of a particular species in ecosystem functioning. Their impacts on human activities are generally negative.

Distressed low-and-high latitude jellyfish populations may also produce negative impacts, due to their important ecological roles. At medium densities, indeed, jellyfish may enhance fish populations by providing shelter and food to juveniles.

Jellyfish blooms are not a new phenomenon, but their persistence and increased frequency is a symptom of stressed ocean ecosystems. At intermediate latitudes, it is a potential harbinger of a shift from fish-dominated to jellyfish-dominated oceans, and as such should not be underestimated. Global drivers – overfishing and climate change – are reinforced by local factors, like increasing availability of coastal substrates suitable for polyp settlement.

Recommendations

On the global level, fisheries must reduce their impact by moving away from industrial practices. Many fish species eat jellyfish, and young or larval fish can probably outcompete jellyfish for zooplankton. More jellyfish predators and less food sources for jellyfish would mean fewer jellyfish – so responsible fisheries are highly desirable. Further, greenhouse gas emissions reductions are essential for slowing ocean warming. Tropical species, while able to benefit from increases in temperature in temperate regions, are likely to be negatively impacted in the tropics. Cold-water species are disadvantaged by warmer conditions.

Local recommendations must be considered on a case-by-case basis. Current suggestions include using jellyfish fisheries to reduce populations. Such options should be explored with care, however, as jellyfish blooms may well be an important part of normal ecological cycles in their respective ecosystems. Reducing eutrophication is an obvious step, but reducing hard coastal substrata is a much greater challenge, given the realities of coastal developments and flood defences.

Lastly, a greater understanding of jellyfish and their ecological roles is necessary before passing judgement on their negative impact on marine ecosystems. Many field researchers are calling for a broadening of jellyfish studies and special observation programmes able to attend the sites of blooms at short notice.



© Paul Marshall

Assessing the risks resulting from a warming ocean

Alongside the forthcoming report on ocean warming, a new analysis of the resulting risks will be published in late 2016. Conducted by IUCN and leading scientists, in close partnership with XL-Catlin, this second report will explore the implications of widespread oceanic changes.

Global assessments of risk typically look to obvious phenomena, and when considering the ocean, frequently only do so from a narrow, anthropocentric perspective. The World Economic Forum's 2014 Global Risks Report, for example, fails to embrace specifics such as ocean warming or acidification, but readily homes in on natural disasters. The report does not adequately assess the impact of gross ocean changes as specific risks, perhaps because scientific work on the subject is not sufficiently visible.

The risk report will address these gaps and omissions, building on current assessment processes but factoring in the latest scientific assessments, and synergistic effects from other stressors. The twin-track approach of developing the science through the ocean warming report, while concurrently assessing the accompanying risks, should produce a strong basis for conclusions and concrete recommendations.

Adapted from chapter by **Ferdinando Boero** (Università del Salento), **Lucas Brotz** (University of British Columbia) and **Mark J. Gibbons** (University of the Western Cape). For more information, please contact Dan Laffoley (danlaffoley@btinternet.com).

Blue Carbon and Blue Forests

Accelerating Successful Blue Carbon Implementation



© Octavio Aburto

Conservation efforts to protect and restore coastal ecosystems as a contribution to climate change mitigation have received increased attention through international efforts, including advancement through the UNFCCC and the IPCC.

The focus has now shifted towards on-the-ground implementation. IUCN is a partner of the UNEP/GEF Blue Forests Project, which seeks to promote better management of coastal and marine ecosystems by emphasizing the values associated with 'blue' coastal carbon and ecosystem services. Blue forest ecosystems include mangrove forests, seagrass meadows and saltwater marshes. They play an important role for coastal communities by providing shoreline protection and fish habitat, supporting marine biodiversity, and storing and sequestering carbon.

IUCN is working with selected international experts through the project's Policy Advisory Panel to deliver targeted advice for the project's Small-Scale Interventions (SSIs) in Indonesia, Ecuador, Mozambique, Madagascar and the United Arab Emirates. National policy assessments are being conducted to gather information on legal and policy frameworks. These will help identify common pathways for progress and barriers, best practices, and opportunities for the management of coastal carbon ecosystems. The SSIs can use these assessments to pursue feasible policy options that reflect each country's specific political, economic and scientific capacities, as well as conditions within particular site areas.

The five SSIs sent representatives to attend a workshop in Berlin (in July 2016) entitled "Workshop on Blue Carbon Pathways to Sustainable Development" to further strengthen informed decision-making in their countries, making use of expertise from international policy practitioners. The national policy assessments

will provide the foundation for discussions on respective policy priority pathways in a national context, and for the overall project goal of greater global application and upscaling of the Blue Forests concept.

Other exciting developments in the blue carbon world community include the establishment of an International Partnership for Blue Carbon, announced by the Australian Minister for the Environment at the Global Landscapes Forum in Paris in December 2015. The Partnership establishes a network of governments, non-profit organisations, intergovernmental agencies and scientists to pool together knowledge and experience to improve understanding of the role of coastal blue carbon ecosystems in climate change mitigation.

This unique partnership has the overall aim of accelerating action to preserve and protect these vital ecosystems through a number of collaborative actions. These include measurement of coastal blue carbon ecosystems and their capacity to absorb carbon emissions; development of innovative approaches to protect and enhance these ecosystems; and capacity-building and knowledge transfer across countries. The partners will meet for the first time in August 2016 to discuss next steps.

For more information, please contact Dorothee Herr (Dorothee.Herr@iucn.org).



Blue Solutions

Promoting success for our Planet Ocean



Blue Solutions is a partnership between GIZ, GRID-Arendal, IUCN and UNEP, funded by BMUB, designed to support practitioners and policymakers in improving the management of marine and coastal biodiversity. The initiative covers a range of topics relevant to the conservation and sustainable use of marine and coastal resources, including marine protected areas and marine spatial planning, among others. A global initiative, Blue Solutions works closely with partner projects of the implementing organisations and a range of other organisations across the globe.

Over the last few months, the approach that Blue Solutions has pioneered has garnered significant attention. A new web platform for showcasing and promoting solutions is currently under development. The new platform, under the name "Panorama", will initially showcase marine and coastal solutions collated by Blue Solutions, as well as protected area solutions assembled by IUCN's Global Protected Areas Programme. Over time, the Panorama platform and the partnership that carries it will gradually expand to feature solutions from other themes. The new platform will officially be launched at the **IUCN World Conservation Congress** in September. It is designed to provide a database of success stories that conservation planners and practitioners can draw on for inspiration and learning. It will also allow for direct interaction between "solution providers" and "seekers".

In early June, the third in a series of **Blue Solutions Regional Forums** brought together more than 100 participants from 24 African countries on Zanzibar. In a large, open conference room with breath-taking views of the Indian Ocean, delegates from African governments, civil society, the private sector and academia spent four days sharing and learning about a wealth of inspiring activities implemented in the marine and coastal realm across the continent. Twenty-eight examples of "blue solutions" were presented and discussed. As one solution provider mentioned, the abundance of distinct approaches demonstrated that there was **"no need to reinvent the wheel if it has already been invented"**. The resulting recommendations were phrased in order to accelerate concrete action towards ensuring the sustainable management and conservation of marine and coastal biodiversity in Africa and beyond. Participants put forward a range of specific suggestions for the further development of the Blue Solutions approach.

To support the uptake of "blue solutions" into global

policy processes, the initiative actively engages at the international level. At the **COP21 in Paris** (December 2015), IUCN presented a publication showcasing a number of marine and terrestrial protected area solutions to address climate change, in the presence of a number of African "solution providers" to whom support had been given to allow them to attend the conference.

"Blue Planning in Practice" is a new training course designed by the Blue Solutions Initiative. It enables planners and decision makers to develop and engage in marine and coastal planning and implementation processes across different contexts and settings, at a broad range of scales. Thanks to its modular structure, it is a participatory and accessible course that can be used to support a breadth of planning processes.

Blue Solutions has also successfully concluded the **Sustainable Oceans Lab (SOL)**, a year-long leadership programme. The SOL gathers 30 leaders and change agents from government, business and civil society across 5 continents and 17 countries. Over the course of the year, the lab team met in Germany, Mexico and South Africa to develop means of testing new solutions for the sustainable management of our oceans.

Looking ahead, Blue Solutions will continue to facilitate knowledge sharing and exchanges of approaches, making a crucial impact on sustainable management of our oceans and coasts. To find out more, visit the Blue Solutions corner at the **Oceans & Islands Pavilion during the IUCN World Conservation Congress**, or attend one of the Blue Solutions session at the Pavilion.

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Project REGENERATE in the Maldives

The Maldives resemble an accidental dash of paint on the world map. Looking very closely, they can only just be identified on the map as a smattering of tiny little specks in the vastness of the Indian Ocean. The Maldives are geographically unique, comprising 1192 islands with a land area of about 300 km² dispersed over a total area of 923,000 km².



Left: The map shows areas of coral bleaching in the Maldives by Maldives Marine Research Centre, MRC. Data were collected via citizen scientists and marine biologists who reported coral bleaching to the MRC- and USAID-supported Project REGENERATE, implemented by IUCN.

system can include data on just about anything – population concentrations in certain areas, positions of significant landmarks, and in the case of the Maldives, it can even be used to identify reef crests and lagoon floors of atolls. GIS allows all these different types of information, regardless of their source or origin,

to be overlaid on top of one another on a single map.

How can this technology be useful in a country like the Maldives?

As GIS allows datasets to be overlaid, it allows decision-makers to gain a better understanding of geographical spaces so that informed decisions can be made, including identifying important areas to protect, or potential areas of conflict to manage.

GIS was particularly useful during IUCN Maldives' stakeholder consultation in Ukulhas in early 2016. Raw information was collected from fishermen, guest-house operators, divers and island councillors on how they use their

environment. The participants were then given maps of North Ari Atoll and asked to identify areas of ecological and social significance to them. The participants marked how they used marine resources on their maps; for example, divers identified popular dive sites, whilst the fishermen identified locations where they catch baitfish and spots they frequently visit for fishing. The information was then digitised with the help of GIS to generate a visual representation of how the North Ari Atoll communities use marine resources. These maps can now be used by policymakers to devise management plans that ensure natural resources in that area are being efficiently and sustainably used, whilst bearing in mind the needs and concerns of different stakeholder groups.

GIS was used by the Maldives Marine Research Centre (MRC) to map reports of coral bleaching and to identify the locations and spatial patterns of bleaching (see Figure above left). Laying out all the information on a single map proved to be useful in recognising the severity of bleaching events, and identifying areas to focus on at a glance.

Article written by Farah Ahmed. For more information, please contact Ameer Abdulla (ameer.abdulla@iucn.org).



Behind Outbreaks of the Crown of Thorns Starfish

COTS disposal following an outbreak. © Dive Oceanus, Paradise Island Resort & Spa.

The natural environment has several means of maintaining equilibrium in ecosystems. This balance is essential for keeping interconnected systems healthy and productive.

Despite their bad reputation, crown of thorns starfish (COTS - *Acanthaster planci*) play an important ecological role in diversifying coral reef systems by feeding on fast-growing coral species, creating space for new colonies to attach, and allowing slower-growing massive coral species to thrive. A healthy reef harbours many predators of the starfish: the giant triton, Napoleon hump-head wrasse, puffer fish and triggerfish are all known to prey on COTS. As long as this balance is maintained, COTS do not pose a threat to coral reefs.

When the natural balance is disturbed, however, outbreaks of COTS populations can occur. An outbreak is usually defined as 30 or more adult starfish per hectare on reefs (see www.reefresilience.org). During an outbreak, large numbers of COTS feed on corals at a faster rate than corals can recover, causing long-term damage that may take years (or even decades) to repair. COTS outbreaks can completely decimate a reef in a short amount of time if they are not controlled.

Recent research suggests that areas of high nutrient-loading sup-

port an abundance of phytoplankton, on which larval and juvenile COTS feed. Normally, a spawning female releases 12-24 million eggs with a survival rate of about 0.00000001%, or 2 adult COTS. In nutrient-overloaded waters, larvae survival rates increase to 0.1%, or 20,000 adult COTS. Thus, high nutrient levels in the water, primarily from sewage and coastal runoff, can cause COTS outbreaks.

Another possibility is that COTS predators are simply disappearing. Declines in predator populations (particularly those of the giant triton shell) driven by overexploitation and habitat destruction encourage the survival of juvenile and adult COTS. There is little evidence, however, that predation plays a significant role in COTS population control, as starfish have regenerative abilities – they need to be consumed whole to die. Hence, targeting the reduction of larval survival rates by reducing water pollution and monitoring water quality of reefs can be a more effective long-term approach to mitigating COTS outbreaks. In order to mitigate damage to the coral reef, COTS populations need to be controlled and removed

during outbreaks by divers and snorkelers, though this can be manpower-heavy and disposal can be problematic.

In late February 2016, the #KilltheCOTS campaign was launched by the Divers Association of Maldives, alongside volunteers from the diving community and NGOs. A total of 944 COTS were successfully removed from reefs in the Male' region. Questions remain as to how long the battle will go on, and whether a feasible long-term solution exists. Humanity is, directly and indirectly, intervening in nature's process and inducing stresses onto the Maldives' fragile reef systems. Our actions are perpetuating chain reactions that negatively impact coral reefs and, consequently, Maldivians' livelihoods. Proper management of marine areas and sustainable development are essential for protecting coral reef systems against such damaging imbalances.

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Zamicko: The Exemplary Councillor from Ukulhas

© IUCN/Maldives

For the adventurous traveller, the world is rich with natural phenomena seen once in a blue moon. The Maldives are home to one such occurrence, “starry beaches”, caused by bioluminescent phytoplankton activity. During my visit to Ukulhas last month, I witnessed a surprisingly rare occurrence: a young islander nonchalantly picking up the trash he came across in his path. Witnessing a Maldivian pick up another person’s trash of their own volition was completely new to me.

I later learned that this young man, Ali Zameer, colloquially known as Zamicko, is a councillor of Ukulhas who wishes to change any preconceived notions Maldivians have about the collaborative effort that goes into proper waste management. Picking up trash himself is his humble attempt to lead by example and show that these actions need not be rare or exceptional.



© Emma J Pettersson

Ukulhas is already famous for its waste management system, becoming the first community in the Maldives to implement one in 2012. Today, Ukulhas can be accurately described as one of the cleanest community islands in the Maldives. So what prompted Ukulhas to start this movement? “Back in 2008 or 2009, two tourists visited the island and left within an hour because of the amount of waste on our beach, and pretty much everywhere else”, Zamicko says. “They looked around, criticised us quite harshly, hired a transfer back to their resort and left because they were so disappointed. That’s when we realised something had to be done.”

According to Zamicko, a lot has changed since that incident. “Things have changed so much that people actually pick up any litter they come across on the roads. And I think it has actually gotten to the point where people are slightly embarrassed to litter because we emphasise proper waste management so much,” he explains. “People need to realise that

it is everyone’s civic responsibility to manage waste properly, instead of a mandatory obligation they are burdened with.”

Zamicko says that non-littering habits needed to be developed and ingrained into local communities at the earliest possible stage in their lives. “We ran a poster competition for school children of all grades to (...) depict positive messages about a cleaner environment. The aim of this was to encourage the students not to litter, and we also hope that when they see their posters around the island, it would motivate them to encourage their friends not to litter,” Zamicko elaborates. “You will only see the results of what we’re doing now in the long run. We’re teaching the new generations the best practices and the importance of not littering.”

New developments and the booming guesthouse business also help to maintain Ukulhas’ cleanliness. The guesthouse operators are keen to advertise pristine beaches, and to this effect, each guesthouse contributes \$10 per room every month for clean-up efforts and to place recycling bins around the island. “Our aim is to be the model island in the Maldives. Ukulhas took the initiative to set up a waste management system on its own in 2012, whereas the other islands did not start similar projects until 2014. Since then we have brought in over 80 island councillors from different atolls to show them how we carry out our efforts, and we conducted 15 workshops on good practices in waste management in the last year alone. You could say we are an ambitious bunch; we want to be the leading example in the Maldives.” Zamicko concludes.

Article written by Farah Ahmed. For more information, please contact Ameer Abdulla (ameer.abdulla@iucn.org).



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Community Voices



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There is an old lore that says that tuna fish were brought to Maldivian waters by a mythical seafarer called “Bodu Niyami Kalefaanu” who sailed to the “Dagas” – a mystical tree at the end of the world – to bring the valuable fish here. Science tells us that the abundance of tuna in the Maldives might not be due to this mythical seafarer but rather that the Maldives are blessed with amazingly diverse marine life due to their unique biogeography.

There is no doubt that the lives of Maldivians are closely intertwined with the ocean. Fish is their main source of food, and they depend on the natural resources provided by the ocean for their livelihood. Since Maldivians and the ocean are so closely linked, it is important to conserve and manage marine resources effectively to sustain them for future generations. One of the main objectives of Project REGENERATE is to work towards establishing a resilience-based management framework in order to maintain a healthy coral reef ecosystem in Maldives. This approach leads to more informed decision-making, as traditional knowledge and local sources of information are integrated into the process, promoting local adaptation and management. Earlier this year, the IUCN team travelled to Ukulhas – an island traditionally famous for its fisheries – for a consultation meeting with the local community stakeholders of North Ari Atoll. Consulting with the stakeholders provided useful insights into the interactions between social values and resource use in North Ari Atoll, and also helped to identify areas where different demands on the reef might overlap.

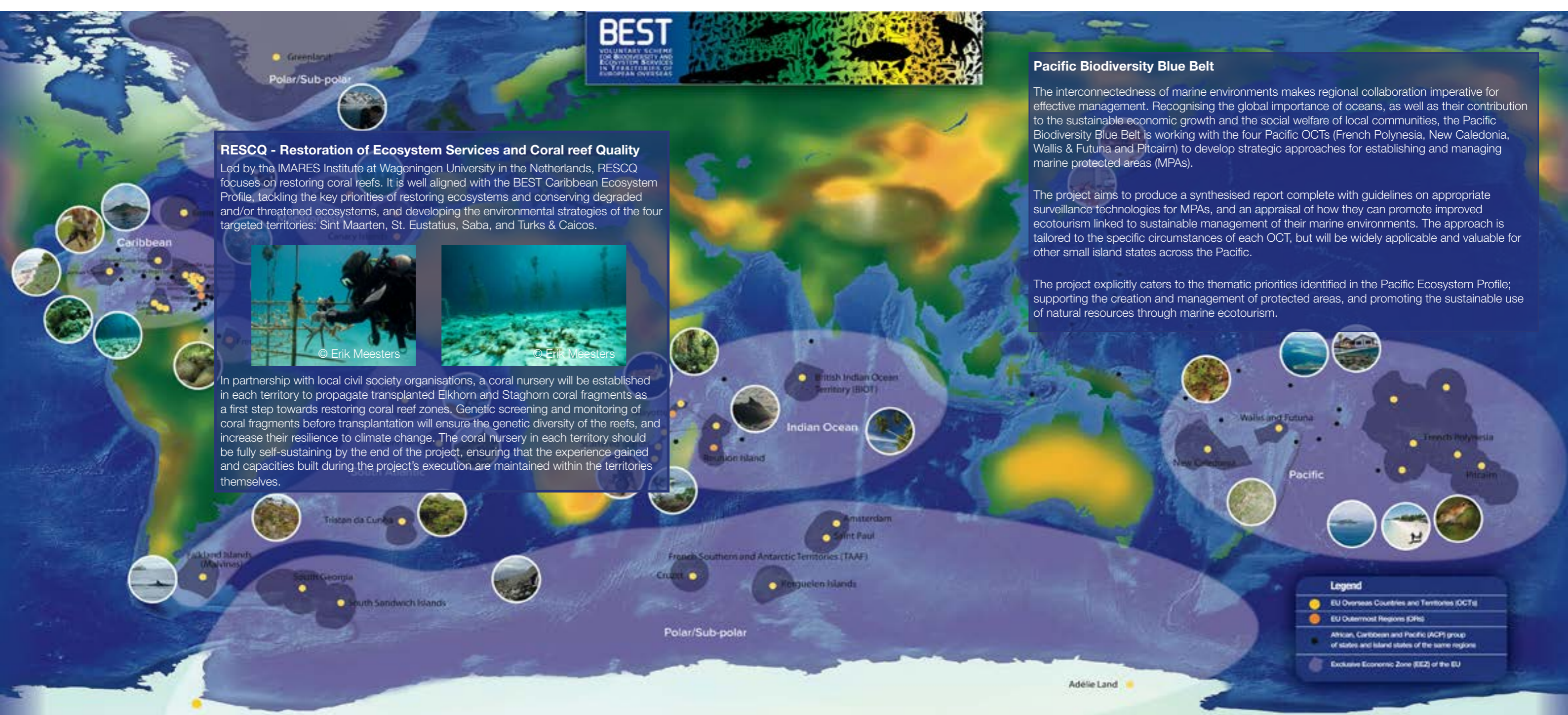
The participants were divided into three groups. Each group was given a map of their specific region, and asked to pinpoint the areas that they considered to

be ecologically and socially significant. After hours of deliberating and meticulously detailed mapping, the participants presented their results to the other groups. The participants had mostly identified how they used marine resources – in particular, the spots commonly used for fishing and diving.

The fishermen identified land reclamation as a major concern, as it causes sedimentation, which may in turn damage surrounding coral reefs as well as the lagoons being reclaimed. This can have negative impacts on guesthouse owners as well, as potential dive spots are lost. Marine creatures are closely integrated into local cultural identities. Consequently, participants were adamant about protecting coral reef creatures from damage, and preventing them from being forced away to other areas to escape environmental degradation. Other concerns raised by many of the participants included anchoring of boats in reef zones, as this destroys the colourful coral reefs; and illegal spear fishing, since it targets large individuals in concentrated areas, severely damaging population demographics.

The mutual understanding of the importance of the environment for livelihoods amongst all concerned parties was heart-warming to see. A common understanding emerged that a concerted effort needs to be made to manage marine areas more efficiently and sustainably. Participants demonstrated a genuine passion for working collectively to foster a more sustainable environment for all Maldivians.

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RESCQ - Restoration of Ecosystem Services and Coral reef Quality

Led by the IMARES Institute at Wageningen University in the Netherlands, RESCQ focuses on restoring coral reefs. It is well aligned with the BEST Caribbean Ecosystem Profile, tackling the key priorities of restoring ecosystems and conserving degraded and/or threatened ecosystems, and developing the environmental strategies of the four targeted territories: Sint Maarten, St. Eustatius, Saba, and Turks & Caicos.



In partnership with local civil society organisations, a coral nursery will be established in each territory to propagate transplanted Elkhorn and Staghorn coral fragments as a first step towards restoring coral reef zones. Genetic screening and monitoring of coral fragments before transplantation will ensure the genetic diversity of the reefs, and increase their resilience to climate change. The coral nursery in each territory should be fully self-sustaining by the end of the project, ensuring that the experience gained and capacities built during the project's execution are maintained within the territories themselves.

Pacific Biodiversity Blue Belt

The interconnectedness of marine environments makes regional collaboration imperative for effective management. Recognising the global importance of oceans, as well as their contribution to the sustainable economic growth and the social welfare of local communities, the Pacific Biodiversity Blue Belt is working with the four Pacific OCTs (French Polynesia, New Caledonia, Wallis & Futuna and Pitcairn) to develop strategic approaches for establishing and managing marine protected areas (MPAs).

The project aims to produce a synthesised report complete with guidelines on appropriate surveillance technologies for MPAs, and an appraisal of how they can promote improved ecotourism linked to sustainable management of their marine environments. The approach is tailored to the specific circumstances of each OCT, but will be widely applicable and valuable for other small island states across the Pacific.

The project explicitly caters to the thematic priorities identified in the Pacific Ecosystem Profile; supporting the creation and management of protected areas, and promoting the sustainable use of natural resources through marine ecotourism.

BEST 2.0: Translating knowledge into actions in the EU OCTs

More than 3.5 million euros have been invested in the biodiversity of the EU Overseas Countries and Territories (OCTs) through the BEST 2.0 Programme following the first two calls for proposals launched in 2015. Considering the extent of the OCT's combined exclusive economic zones (EEZs) it is hardly surprising that half of the 16 funded projects – 3 of the 8 small grants and 5 of the 8 medium grants - have a marine focus. Project activities range from tracking seabirds using GPS (global positioning system) tags to identify important marine areas and inform

the management of the marine environment around the island of Grand Colombier in Saint Pierre and Miquelon, to developing environmental educational resources and establishing snorkel trails in the British Indian Ocean Territory, reflecting the diversity of the territories themselves as well as the array of threats and pressures they face.

BEST 2.0 capitalises on the extensive work done by the BEST III project – also coordinated by IUCN – to develop a regional ecosystem profile for each of the 7 regions where the 34 EU Overseas entities are located. Projects submitted for funding are assessed for their relevance to the conservation priorities

identified in the regional ecosystem profile as well as other relevant local, territorial and regional strategies. This informs the European Commission's selection of projects to be awarded a grant. The ecosystem profile elaboration process engages local and regional experts, authorities and other stakeholders through workshops and consultations in the delineation of key biodiversity areas (KBAs), which is based on a scientific habitat, species and threat assessment and results in the identification of priority areas for action.

Empowering and strengthening local authorities and civil society organisations in the OCTs,

and promoting partnerships at all levels, between actors in the individual territories, between the individual territories and at the wider regional level to achieve this is a fundamental principle of BEST 2.0. Half of the projects awarded a medium grant cover two or more of the OCTs and have a strong focus on close cross-territory collaboration and experience-sharing. These two aspects are exemplified by the RESCQ project in the Caribbean and the Pacific Biodiversity Blue Belt project in the Pacific.

The positive response to the calls for proposals launched in 2015 underlined the large demand for funding and the enthusiasm of actors in the regions, and reinforced the

necessity for a tailored approach incorporating regional support and capacity building. To facilitate longer-term investments in the regions regional investment strategies are currently being developed under the BEST III project in collaboration with local actors looking at current and past investments and the absorption capacity for conservation funding. The strategies will present project concepts that are ready to be implemented over the next 5 years and address the priority areas identified in the ecosystem profiles.

The combined science-based and participatory approach followed during the development of the ecosystem profiles along with the close

collaboration between the BEST 2.0 programme and the BEST III project enables the available funding to be invested strategically by directing it to projects that address the real needs on the ground.

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http://ec.europa.eu/environment/nature/biodiversity/best/projects/current/index_en.htm

The BEST ecosystem profiles

Making the EU Overseas waters a priority area for action

The majority of the 34 European Overseas entities reside on islands, many remote from continents. Spread across all large oceans of the globe, they gave rise to a unique and rich biodiversity. Comprising over 70% of Europe's species diversity, they have been internationally recognized for their global importance and include 5 biodiversity hotspots.



However, the ecosystems as well as their biodiversity are vulnerable and already affected by the impacts of climate change and other threats, such as invasive alien species, habitat degradation, over-exploitation of natural resources and unsustainable development.

Despite increasing awareness of the value of healthy ecosystems for biodiversity and local communities, and the imminent threats they face, a systematic assessment of species, ecosystems and threats using a common methodology had never been done for the 7 European Overseas regions. One of the objectives of the BEST III project, launched end of 2013, was therefore to develop regional ecosystem profiles (EPs) using a methodology established by the Critical Ecosystem Partnership Fund (CEPF) and adapted to the EU Overseas, in which key biodiversity areas (KBAs) are identified based on standard assessment criteria in order to

define priority areas for action for conservation and sustainable development.

Over the past two years 7 regional knowledge hubs have mobilized more than 870 local and regional actors, experts and authorities from over 340 organizations and institutions through a participatory process to discuss the latest available scientific data and observations of the regions' biodiversity and habitats, taking into account threats and conservation status. The results were then presented alongside the respective socio-economic and political context together with an analysis of current conservation activities and relevant investments in the region. In over 70 workshops and consultations, a total of 405 priority KBAs were identified for the 7 EU Overseas regions, covering over 6 million km², of which 85% comprise marine and coastal areas.

Prioritizing over 5 million km² of

marine areas as sites of global significance for conservation demonstrates the importance of the EU Overseas waters, which collectively cover over 19 million km² or 5% of all oceans and represents the world's largest maritime domain. While the identification of KBAs is a common approach for systematic conservation planning, a standard methodology for delineating marine KBAs has not yet been established, mainly due to the lack of information on species' distribution and migration routes and hence their conservation status. Considering that 80% of territory of the 34 EU Overseas entities comprises marine areas, and that local livelihoods on over 150 of its islands largely depend on the ocean's natural resources, it is not surprising that stakeholders plunged into the challenge of advancing the KBA methodology to better delineate marine sites of biological significance and guide future conservation and investment efforts.

In addition to 72 marine and 59 coastal KBAs, the consultation process also revealed common thematic priorities with a marine focus in the 7 regions, such as improvement of baseline data and knowledge of species and ecosystems to better inform marine ecosystem management, strengthening the network of marine protected areas (MPAs) through management support and connecting existing MPAs as well as education and awareness

raising on marine ecosystems and their sustainable management. The results of this inclusive and comprehensive ecosystem profile exercise serve as the basis for a Regional Investment Strategy (RIS), in which the identified priority areas for action are presented as investment niches over the next 5 years with project ideas, proposed with an estimated budget and duration, taking into account the current and past investments as well as the capacity for the

implementation of conservation projects in the region. Aimed at potential donors wishing to invest in the region's conservation and sustainable development, as well as at organizations for effective targeting of their efforts, it is hoped that the RIS will be taken into account for national biodiversity strategies or conservation planning.

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Europe's Overseas Regions

Essential Players in Marine Protection and Ocean Governance

Spanning five oceans, with a combined exclusive economic zone (EEZ) of over 19 million km², Europe's Overseas Regions (EU Overseas) cover the world's biggest maritime area and host three of the five largest marine protected areas (MPAs) to date.



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The 34 political entities and over 150 islands are key actors in championing sustainable ocean governance and progressing towards the Aichi Targets and the Sustainable Development Goals (SDGs) by making bold commitments on ocean and marine wildlife protection as well as harnessing the power of the oceans for renewable energy generation.

In 2009, the world's first entirely high-seas marine protected area (MPA) was declared around the UK South Orkney Islands in the South Atlantic. France established the Marine Natural Parks of Mayotte in 2010 and Glorieuses in 2012, which together protect a total area of 110,000 km² in the Indian Ocean. In 2014, New Caledonia created the Coral Sea Natural Park, the world's largest MPA to date, covering almost 1.3 million km².

In 2014, the British Virgin Islands established a shark and ray sanctuary within its EEZ, and in 2015 the Caribbean Netherlands opened the Yanari Sanctuary for sharks and marine mammals. These, along with the AGOA Marine Mammal Sanctuary in the French Antilles, help to protect large ecological migration corridors. They also demonstrate a more integrated approach to trans-boundary ocean management, respectful of key, emblematic species

in regional waters.

In 2015, France announced the extension of its largest natural reserve in the French Southern and Antarctic Territories (TAAF), and France, Australia and the EU proposed the creation of new MPAs in the Antarctic Ocean. TAAF is pioneering science-based fisheries management approaches in cooperation with scientific organizations such as IFREMER (French Research Institute for Exploitation of the Sea), IRD (Institute of Research for Development) and fishing industry professionals.

French Polynesia is working towards designating its entire EEZ (around 5 million km²) as a Marine Managed Area (MMA) with regulated fishing areas, which respect and integrate *ra'hui* – traditional community-based marine resource management. It would also include Pukatai, a pilot network of six Educational Managed Marine Areas (EMMAs) in the Marquesas Islands. Pukatai fosters a new generation of ocean stewards by providing coastal zone management training for youth.

The UK government recently introduced an initiative to create the world's largest no-take (no fishing) marine reserve around the Pitcairn Islands in the Pacific, protecting a total area of 834,000 km². In early 2016, it also committed to designating an MPA in the Atlantic waters

around Ascension Island almost as big as the current size of the UK.

Healthy oceans can also support climate commitments related to the transition to renewable energies. Sea Water Air Conditioning systems in French Polynesia use cold water from the ocean depths to replace conventional air conditioning systems, enabling energy savings of up to 80%. Ocean Thermo Energy Conversion projects in Martinique harness the difference in temperature between surface and deeper waters to generate electricity, offering remote maritime regions the remarkable possibility of achieving energy independence.

Supporting the EU Overseas' global role in sustainable ocean governance, through both individual actions and regional cooperation, will be instrumental in achieving international goals and targets related to healthy oceans, restoring and preserving the integrity of marine ecosystems, and building resilience to climate change.

For more information, please contact Carole Martinez (carole.martinez@iucn.org).

Vamizi: Conserving Today to Improve Tomorrow

For over 20 years now, the Marine Conservation and Research Centre (MCRC; previously known as the Maluane Project) has been working to preserve the Mozambican island of Vamizi, one of the most pristine marine ecosystems in the Indian Ocean. Partnering with some of the organisations on the frontline of conservation (Zoological Society of London, WWF, WCS, and more recently, IUCN), as well as international and local universities (the latter including Lúrio and Eduardo Mondlane Universities), the project was set up to protect marine and coastal resources, and help local communities to ensure their continuous and sustainable use.

The project has successfully engaged with local communities with the establishment of the Community Sanctuary. Realising that the livelihood of future generations depended on sustainable use of marine resources, the local community closed off an area of about 10 000ha to be converted into a zone where fish populations could grow and reproduce, allowing fish stocks to remain high. A recent publication (Silva et al, 2015) documents the sanctuary's significant and consistent effect on promoting the abundance and distribution of reef fish, within 10 years of being established. A joint effort between local communities, government, the private sector and conservationists, this remains one of the few successful and functioning examples of its kind in Mozambique.

To ensure these efforts continue for decades to come, it is vital to involve younger generations in carrying out marine and coastal projects. With the assistance of the Friends of Vamizi Trust, a weekly "Wildlife Club" has been estab-

lished in which children from the local primary school are introduced to our conservation and research projects. Each time a new research project is established on the island, the children are invited to learn about what is being done, what the researchers are trying to learn, and why it will help preserve the island's ecosystems. Engaging the island's children is essential, be it the sea turtle monitoring, humpback whale photo-ID or shark tagging projects. This approach aims to nurture the deep-seated love the children already have for their island and its unique wildlife, fostering the next generation of conservationists.

To inform all of these activities and efforts, the MCRC focuses its work on a range of research projects. Long-term initiatives have been established, including green turtle nest monitoring, and grey reef shark tagging. These will help protect some of the region's most important populations of these respective species, gaining a crucial insight into their conservation status and behavioural dynamics. As a pristine,

unexplored and protected area (primarily due to the Community Sanctuary), Vamizi attracts specialists from many different fields. This diversity drives projects looking into previously un-researched topics, while also helping understanding Vamizi's standing from both a regional and global point of view, when it comes to the state of its underwater resources. Each year, a group of undergraduate students from Lúrio University join the MCRC to conduct small research projects to complete their studies. Not only does this add to overall knowledge of the wildlife on the island; it also contributes to the training and development of new biology and conservation professionals in the country.

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New Resource Guide Maps out more Effective Planning Strategies for Seismic Survey Techniques and Environmental Imaging

The oceans are a noisy place, from natural sounds made by animals or caused by storms and earthquakes, to human-made noises caused by marine seismic surveys, ships, sonar and others. What happens when these interact? How can we manage ocean noise to reduce its impact on whales and other marine species which rely on sound as their “underwater eyes” in navigation, foraging and communication?

At the IUCN World Conservation Congress in September 2016, a new practical guide for the environmentally responsible planning of marine seismic surveys, a source of the loudest human-made noise in the ocean, will be released.

In seismic surveys, air guns towed behind ships emit powerful, repeated bursts of sound. Sensors measure the return echo to reveal details of the sea floor and underlying geologic structure to a depth of several kilometres. Sound is a powerful tool for imaging and investigating the sea floor, and is deployed primarily by the energy industry to pinpoint the location of oil or gas deposits. Such surveys are also used for mapping the continental shelf and for finding the best sites for new offshore wind energy projects.

Whales rely on sound for communication, navigation and foraging. Exposure to loud noise from seismic surveys can result in stress and behaviour changes, affect their search for food and nursing, and even cause direct physical damage.

While many of the lessons-learned examples guiding the recommendations in the IUCN’s publication come from planning and implementation of large-scale airgun surveys, the authors also consider the responsible planning of other forms of environmental imaging surveys associated with offshore exploration and energy production.

Effective planning strategies for managing environmental risk associated with geophysical and other imaging surveys: A resource guide for managers covers all of the relevant considerations and evaluation parameters. All stages of operations are considered within a systematic risk assessment-based self-evaluation before, during and following survey operations. These concepts are based on progress in scientific studies of potential impacts, and practical observations of operations and associated monitoring and mitigation from several decades of seismic surveys. Increasingly complex regulatory evaluation, sustained research efforts, and technological improvements all help inform a logical and structured approach to the responsible conduct of high-power marine seismic surveys and other forms of environmental imaging.

The manual will be of particular interest to environmental managers and operational leads of survey activities, from either industry or research entities, as well as the regulatory managers responsible for the assessment and effective mitigation of their potentially negative environmental impacts.

With respect to potentially impacted species, the focus here is primarily on marine mammals, logically so since, in addition to existing as top predators in most marine ecosystems, they are commonly afforded relatively greater regulatory protections in different parts of the world. However, the elements of this planning tool are applicable and adaptable to any environmental focal species that may be locally important, e.g., vulnerable fish and sea turtles.

Building on a scientific article published in 2013, this publication provides more detail on many of the envisaged processes as well as current and comprehensive references for regional-specific operational practices, regulatory requirements and criteria, data analysis and archiving, and other practical guidance for effective and responsible planning.

Another IUCN-WWF-IFAW publication **Western Gray Whales Advisory Panel: Stories of Influence** will also be unveiled at this year’s IUCN Congress. It explores the lessons learned from working with the oil and gas industry for more than a decade to mitigate the impacts on the western gray whales in the Russian Far East. www.iucn.org/wgwap.

Both reports will be published in the IUCN library online: <https://portals.iucn.org/library>. For more information, please contact Anete Berzina (anete.berzina@iucn.org) or Giulia Carbone (giulia.carbone@iucn.org) from IUCN’s Business and Biodiversity Programme.



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UN takes Significant Step towards a New Treaty to Conserve Marine Life Beyond Boundaries



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In response to mounting concerns about declines in ocean health, the United Nations finally delivered some good news in April 2016. The first of four two-week UN Preparatory Committee sessions concluded on a positive note, identifying the key elements of a new treaty designed to better protect and sustain marine life in the two-thirds of the ocean considered to be international waters. The second session will be convened from 26 August to 9 September this year.

The preliminary discussions achieved broad agreement on three of the four main topics under consideration. These included the need for precautionary action to sustain the health of species and ecosystems through networks of marine protected areas; the need to review the impacts of human activities prior to approving them so that measures can be taken to avoid significant adverse harm; and the need for marine management to embrace entire ecosystems, rather than narrow geographic areas or a single species.

Significant progress was also made on the fourth – and most contentious – issue: how benefits derived from marine genetic resources from the High Seas and the International Seabed Area might be shared within the global community. While differences remain as to whether living marine resources in such areas are, or should be, part of the ‘common heritage of mankind,’ discussions are now turning to more pragmatic frameworks for establishing what kind of benefits might be considered, and how they might be fairly and equitably shared. States also agreed to recognise the impor-

tance of enhancing marine scientific research and building the capacity of developing countries to ensure effective implementation of the agreement. This can lead to benefits for developing and developed countries alike. Recommendations for draft elements for a third implementing agreement to the 1982 UN Convention on the Law of the Sea are to be delivered to the General Assembly by the end of 2017. Though many difficult hurdles remain, it is widely hoped that a decision to launch formal negotiations for the new treaty will be taken by 2018.

At stake is no less than the future health of the global ocean and its role in sustaining and nourishing life on this planet. The first World Ocean Assessment, released by the UN in January 2016, reveals that the oceans have absorbed more than 93% of heat generated by increasing CO₂ emissions, strongly dampening the land impacts of higher greenhouse gas concentrations. Nevertheless, while rising CO₂ emissions are raising water temperatures, they are also contributing to increasing ocean acidity and shrinking oxygen supplies. Such adverse impacts

on the ocean are decreasing the ability of many marine species to find food, reproduce and tolerate the multiple additional stresses inflicted by overfishing, pollution and habitat degradation.

A robust new treaty is, therefore, absolutely essential. Saving the High Seas and International Seabed Area is beyond the capacity of any one nation: international cooperation is of critical importance. Despite continuing disagreement on principles and priorities, it is hoped that UN member states can keep the spirit of Paris alive, paving the way for a new treaty that places the common interests and common concerns of all states and peoples at its heart.

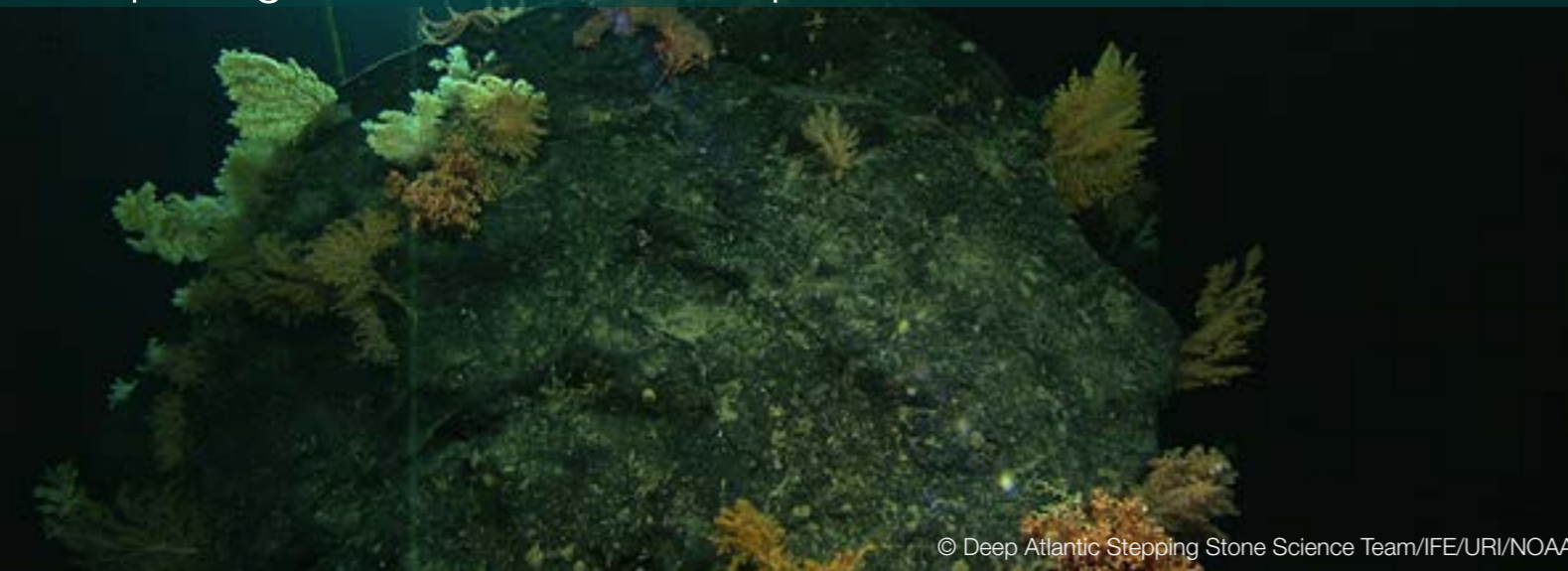
Further Reading:

On IUCN’s role in the process: see “Can the world agree on how to conserve the oceans?” Blog by Lydia Slobodian, Legal Officer, IUCN: <https://www.iucn.org/content/un-takes-significant-step-towards-new-treaty-protect-marine-life-beyond-boundaries>

For more information, please contact Kristina Gjerde (kristina.gjerde@eip.com.pl).

Deep Sea Mining

Exploring the environmental impacts and unknowns



© Deep Atlantic Stepping Stone Science Team/IFE/URI/NOAA

Often compared to outer space in its vastness and mystery, the deep sea is aptly described as Earth's final frontier. Accounting for 95% of the ocean's entire volume, the deep sea is the world's largest biome. Although it remains predominantly unexplored, past expeditions have revealed that the deep ocean supports an astonishing abundance of unique biodiversity, habitats, and ecosystems. Once considered isolated and unattainable, recent technological advancements have forever changed the world's perceptions of the deep sea. In combination with commercial interests, these technologies are driving the 'blue economy' deeper and deeper into the oceans' uncharted territories in an effort to exploit the wealth of deep-sea resources, despite the potential for irreversible environmental damage.

Where is deep seabed mining taking place?

Deep seabed mining is at the forefront of deep-sea commercial activities. As of July 2015, the International Seabed Authority (ISA) has issued 27 contracts to selected public and private interests for exploration of minerals found on the deep seabed. The majority of these exploration contracts are for manganese nodules within the Clarion-Clipperton Fracture Zone in the Central Pacific, with the rest of the contracts exploring the Central Indian Ocean Basin, South West Indian Ridge, Central Indian Ridge, Mid-Atlantic Ridge, and the Western Pacific Ocean.

Several of the issued exploration licenses are due to expire in 2016, raising the question of whether they will be renewed and extended to allow deep seabed mining

to begin on an industrial scale. Exploitation licenses have not yet been issued by the ISA; however, a regulatory framework is currently under development for commercial mining permits in the deep seabed "Area" beyond national boundaries.

Two national governments are known to have already issued deep seabed mining exploitation licenses within the national jurisdiction of their states' Exclusive Economic Zones. The government of Papua New Guinea issued one such license to Nautilus Minerals for use in the Solwara 1 Project, taking place in the Bismarck Sea. The other was issued by both Saudi Arabia and Sudan in a joint venture with Manafa International and Diamond Fields International to exploit mineral deposits in the Red Sea. Although neither one of these projects has yet begun industrial

mining operations, Nautilus Minerals is planning to start its exploitation of hydrothermal vents just off the Papua New Guinea coast by 2018. If this commercial mining project is successful, it is likely that many more will follow Nautilus Minerals' lead, subjecting the Pacific Islands region to a future of deep seabed mining activity.

What are the potential impacts of deep seabed mining?

Roughly 1.2 million km² of international seabed area beyond national jurisdiction is currently licensed for mineral exploration, potentially signalling the creation of the largest mining operation that the planet has ever witnessed, dwarfing existing terrestrial mines. With such large areas at stake, and so little knowledge of the dynamics of existing deep sea environments or the potential impacts to



them from mining, there are major concerns about the potential for adverse consequences resulting from large-scale mining activities.

The direct impacts of the physical disturbances caused by deep sea mining in marine environments include digging up benthic animals with mining tools, running them over, destroying or altering their habitat, generating light and noise pollution, and increasing vessel activity on the surface. The less immediate, indirect effects are less well-understood and more difficult to predict. These can include detrimental environmental impacts from sediment plumes and sediment deposition, biodiversity loss, the release of heavy or toxic metals or other tailings, and the recovery dynamics of affected deep sea ecosystems.

Where do knowledge gaps exist?

Perhaps the largest and most crucial knowledge gap is that of baseline information on the biodiversity and ecology, ecosystem functioning and connectivity, spatial and

temporal variations, and resilience of deep-sea species to specific pressures, in deep-sea environments. To place the current lack of knowledge pertaining to the deep ocean and its ecosystems in perspective, **the International Census of Marine Life programme, conducted from 2000-2010, found that every second specimen collected from the deep sea below 3,000m was new to science and had never before been described.**

We do know that species found in the deep ocean are generally slow-growing and long-lived. Two-thirds of all known coral species live in the deep sea and some coral reefs can live up to 8,500 years, perhaps longer. It is known that the deep sea rivals tropical rainforests in terms of biodiversity, and that multiple sites of mining interest are considered biodiversity hotspots (see FFEM-SWIO Project, p.35 of this issue). Species found around hydrothermal vents form isolated communities that have adapted to very particular living conditions. These factors contribute to scientists' belief that deep

sea ecosystems are particularly vulnerable to change and at risk from disturbances. It is estimated that most deep sea ecosystems will take hundreds to thousands of years to recover, if at all, from human disturbances such as deep seabed mining.

Commercial interests and mining technologies are developing at a faster rate than discussions on and regulation of deep ocean scientific research and ocean governance. If deep seabed mining activities are to proceed on an industrial scale, it is essential that existing knowledge gaps are filled, and adequate regulations and governance frameworks are developed, implemented, and enforced. Scientific knowledge is necessary to determine baselines; baselines are essential to establishing comprehensive environmental conservation and management requirements; and sound environmental management is needed for the 'sustainable' development of deep seabed mining.

For more information, please contact Whitney Berry (whitneyberry07@gmail.com) or Kristina Gjerde (kristina.gjerde@eip.com.pl).

IUCN is seeking to ensure that any regulations reflect best environmental practices, the best available data and information, and research requirements. It also promotes application of the precautionary principle and an ecosystem-based approach to management and enhanced international collaboration to increase our fundamental knowledge of the deep sea. The IUCN is an active participant in the Deep Ocean Stewardship Initiative (DOSI), a group of multidisciplinary experts seeking to integrate science, technology, policy, law and economics to advise on ecosystem-based management of resource use in the deep ocean and strategies to maintain the integrity of deep-ocean ecosystems within and beyond national jurisdiction. <http://dosi-project.org>



Arctic World Heritage

Scientists gather in Paris to explore World Heritage potential in the Arctic

© Caitlyn Webster

Scientific experts from around the world gathered at UNESCO's Paris Headquarters in February 2016 for a two-day working meeting to explore possible new marine World Heritage sites in the Arctic. Experts discussed unique and exceptional Arctic features that could merit their inclusion on the UNESCO World Heritage list.

The Arctic is home to geological features and animals found nowhere else in the world. The oldest vertebrate species, the Greenland shark, has recently been estimated to have a life span of 400 years. It is also highly vulnerable to climate change, warming at twice the world average rate. The Arctic is a sink for pollutants originating far from the region itself. The latest area of concern is high concentrations of microplastics – representing a significant threat to human and ecosystem health. As sea ice retreats, and Arctic seas become increasingly accessible for shipping and oil and gas development, the need for conservation of the area's Outstanding Universal Values grows. At present, there are just two World Heritage sites in the region: Ilulissat Icefjord and Natural System of Wrangel Island Reserve. Earlier work by the World Heritage Centre and IUCN determined that the Arctic region is underrepresented on UNESCO's World Heritage List.

Participants debated the unique marine features of the Arctic that are currently underrepresented on the World Heritage List. These include distinctive geological processes, iconic species and high densities of endemic biodiversity found nowhere else. They also studied potential new sites that could meet the World Heritage criteria and compared them with sites that are currently listed on the tentative World Heritage List. IUCN and UNESCO will issue a report on the workshop's findings, laying thorough scientific groundwork to assist State Parties in identifying Arctic marine sites of potential Outstanding Universal Value.

A key conclusion of the meeting centred on the intimate interaction between local communities, traditional cultures and the Arctic's natural environment. It was agreed that the Outstanding Universal Value of the Arctic region should be considered from both cultural and natural perspectives. Further, it was noted that, contrary to the traditional country-by-country approach, marine World Heritage sites must reflect and protect the large-scale features of marine ecosystems.

Traditionally, identification and prioritization of sites for World Heritage listing is undertaken at the national level, but recent trends in identification of marine phenomena and sites for conservation underline the need for trans-boundary supranational and regional cooperation in the identification of sites, as well as their management and governance. Community consultations, and engagement with Indigenous Peoples in particular, are prerequisites for success in this endeavour.

The Paris meeting forms part of an innovative multi-year project led by IUCN in partnership with the Natural Resources Defense Council (NRDC) and UNESCO World Heritage Centre's Marine Programme. IUCN is an official advisor to the World Heritage Committee and works to enhance the role of the World Heritage Convention in protecting the planet's biodiversity. This project was made possible through the generous support of the Prince Albert II of Monaco Foundation, WWF and UNESCO. The results of the workshop are expected to be presented at the Arctic Council Ministerial Meeting in 2017.

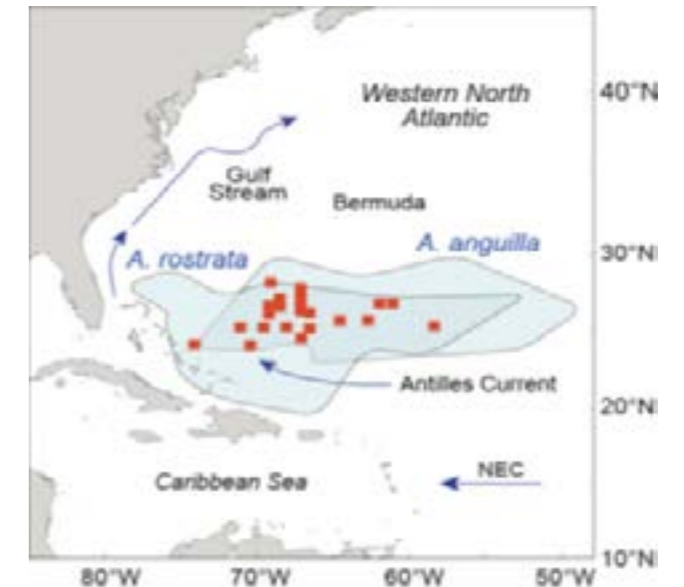
For more information, please contact Tatiana Saskina (Tatiana.Saskina@iucn.org).

Sargasso Sea Commission working to protect a wonder of the Sargasso Sea – the European Eel

The European Eel, *Anguilla anguilla*, is listed as critically endangered on the IUCN Red List. Like the American eel (*Anguilla rostrata*), it only spawns in the Sargasso Sea, in the mid-North Atlantic. The eels' migration to the Sargasso Sea is a true wonder of nature.



© David Curnick



European Eel (Reinhold Hanel). Distributions of *Anguilla leptocephali* in the Sargasso Sea (Miller and Hanel, 2011, unpublished).

European eels spend most of their lives in the fresh or brackish waters of European and Mediterranean countries. Once matured, they undergo major physiological changes to allow them to swim nearly 4,000 miles to an area in the Sargasso Sea south of Bermuda, where they spawn and then die. This unique event has never been witnessed. Scientists have estimated its location by measuring the sizes of larvae (*leptocephali*) in various places. We do know, however, that once hatched, the *leptocephali* make their way back to Europe on the ocean currents for the cycle to begin again. The European eel has seen precipitous declines in recent decades. Some of this is due to the construction of physical impediments to their migration – like dams and weirs – but there is concern that oceanographic changes in their spawning areas in the Sargasso Sea have also affected numbers. The voracious appetite for smoked eel in the sushi trade is also highly relevant. It has generated a lucrative export trade in elvers – tiny eels, caught as they make their way back to coastal waters from the Sargasso Sea. After external trade was banned from EU countries in 2007 and *Anguilla anguilla* was listed under CITES Appendix II, the focus of trade has shifted to *Anguilla rostrata* in North America and the larger Caribbean islands.

The state of spawning areas in the Sargasso Sea is a key concern of the Sargasso Sea Commission, established in August 2014 pursuant to the Hamilton Declaration on Collaboration for the Conservation of the Sargasso Sea and signed by 6 governments: Azores,

Bermuda, British Virgin Islands, Monaco, UK and US. In 2014, Monaco – with the support of the Commission – successfully proposed that the European eel be listed under Appendix II of Convention on Migratory Species, as “having a conservation status which would significantly benefit from international co-operation”. To investigate the ways in which such cooperation may improve the conservation status of this extraordinary migratory species, the Secretariats of the Sargasso Sea Commission and of the Convention on Migratory Species will convene a meeting in Galway Bay, Ireland in October 2016. Drawing representatives from more than 50 states in which European eels are found, as well as experts from North America, the workshop will review the threats to both European and American eels and discuss measures that could be taken at an international level to protect them during migration. One proposal under discussion seeks to apply all the protections that international law allows to the area where they spawn in the Sargasso Sea.

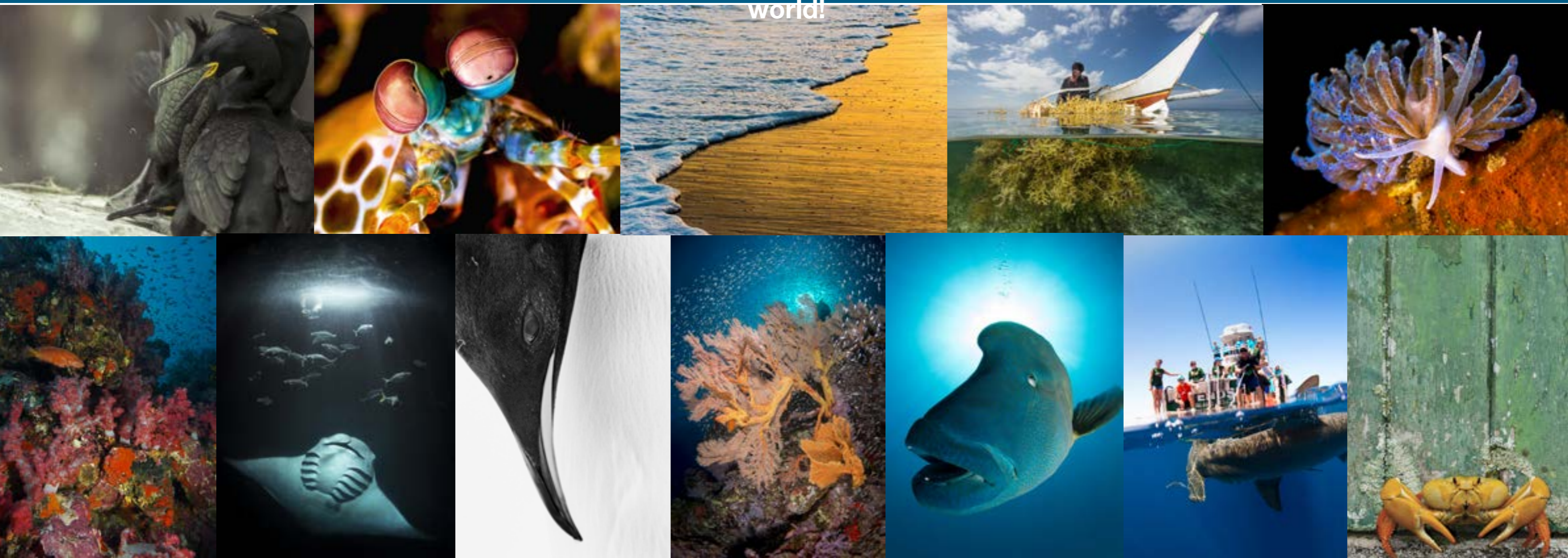
For more information, please contact Dr David Freestone (dfreestone@sargassoseacommission.org) or Faith Bulger (fbulger@sargassoseacommission.org) or consult the website at

<http://www.sargassoseacommission.org>

IUCN GMPP Oceans Photographer of the Year 2016



Over 370 entries from 48 participants around the world!



IUCN GMPP Oceans Photographer of the Year 2016: Winners Gallery

Marine Life: Sean Chinn



The Poles: Guillaume Pépy



Human Impact: Paddy Ryan



Destinations: Lauric Thiault



Open Choice: Mathieu Foulquié



Marine Conservation: Paddy Ryan



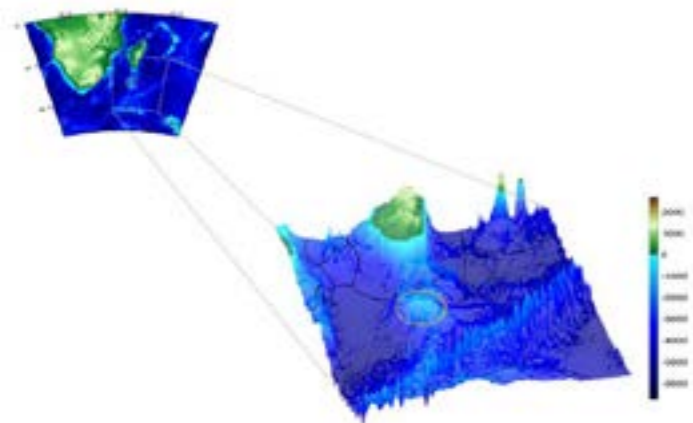
Seamounts: a new expedition in the South West Indian Ocean

© James Cook

IUCN Global Marine and Polar Programme, together with the scientific partners of its ongoing marine conservation project in Areas Beyond National Jurisdiction (FFEM-SWIO Project), will lead an expedition at sea in the South West Indian Ocean in April-May 2017.

The expedition will focus on the Walters Shoal, a unique place in the oceans. The Walters Shoal is a seamount, or group of seamounts, located 700km off the coast of Madagascar. Despite being so far from the shore, the summit depth is only 18m (59ft) below sea level. The 26-day expedition will sample the fauna between the summit and 1500m depths, and more specifically between the summit and 500m depth, an area with a high prevalence of unique, highly-adapted species. In addition to studying the organisms living on and around the seamount, the scientists on board will carry out sampling of some surface-level species, measuring environmental and physical parameters in order to gain a better appreciation of how these specific ecosystems function.

Seamounts are among the least-understood ecosystems on Earth. A very small portion of the 33,500 seamounts (elevation higher than 1500m above the sea-



Map and 3D zoom: shows where the expedition at sea will take place (see Marine News 2014). Situation and 3D maps of the South West Indian Ocean. Bathymetry in meters; Exclusive Economic Zones (black lines); Walters Shoal seamount area (yellow circle).

floor) in the world's oceans have been studied, most of which have been visited or sampled only once. Seamounts are often considered biodiversity hotspots. Migratory fish and cetaceans, as well as seabirds, rely on seamounts for their food supply. These ecosystems are facing major threats. First, from overfishing and potential destruction of habitats through deep-sea bottom trawling; and second, from potential destruction of habitats and pollution from deep sea mining exploration and future exploitation activities. The scientific results from this new research expedition will contribute to increased knowledge and a better understanding of the interconnected role of seamount ecosystems in the biodiversity of areas beyond national jurisdiction (ABNJ) of particular regions. This is an essential step towards biodiversity conservation and sustainable use of ecosystem resources.

The final objective of the project is to propose candidates for Marine Protected Area status, and to help identify adequate conservation measures in ABNJ in the region. This requires collaborating with coastal States, building on existing regional frameworks or initiatives (such as Southern Indian Ocean Deep-sea Fishers Association (SIODFA) and voluntary closing off of Benthic Protected Areas). It also builds on the important work of FAO on Vulnerable Marine Ecosystems, and of CBD on Ecologically or Biologically Significant Areas.

For more information on the FFEM-SWIO project, please contact Aurélie Spadone (aurelie.spadone@iucn.org).

SEAMOUNTS

Mountains of Life

The infographic features a central image of a seamount with various marine life and scientific facts. At the top, a boat is shown on the surface. Below it, a whale and fish are depicted. The text is arranged around these elements, highlighting the ecological importance of seamounts.

- PLANKTON** produces more than **50%** of the **O₂** we breathe and is the primary producer for all life in the ocean. (Note: High concentrations of plankton above and downstream of the seamount.)
- FISH, APEX PREDATORS, MARINE MAMMALS** gather around them, some even using the magnetic signature of the seamounts **TO MIGRATE AND NAVIGATE** through the vast ocean.
- A LOT REMAINS TO BE DISCOVERED** about seamount ecology, species and dynamics.
- HYDROTHERMAL VENTS** support chemosynthetic ecosystems which don't need light to live, and use the heat of the Earth as primary energy. **THEY ARE CONSIDERED ONE OF THE POSSIBLE ORIGINS OF LIFE ON EARTH.**
- UNIQUE SPECIES** high endemism and potential genetic resources.
- UNDER POTENTIAL THREATS** Intensive fishing and trawling. Future mining activities.
- NEEDS** Research, management and protection of these structures. A high seas governance framework.

IUCN logo is visible in the bottom right corner of the infographic.

The project is funded by the French Global Environment Facility (FFEM; <http://www.ffem.fr>) with several cofinancing.

Project partners: National Museum of Natural History (France), the Institute of Research for Development (IRD, France), Institute for Sustainable Development and International Relations (IDDRI) and Oxford University. The project is supported by the French Ministry of Foreign Affairs and the French Ministry of Higher Education and Research.

Project implemented in collaboration with several institutions, ongoing projects or programmes: notably, the Department of Environmental Affairs and the Department of Agriculture, Forestry and Fisheries of South Africa, the Deep Sea Project of the FAO ABNJ Program and its partners, The Nairobi Convention, The Southern Indian Ocean Deepsea Fishers Association, universities in South Africa and Reunion Island, IFREMER, the International Seabed Authority, SAPPHERE and AfriCOG.

Hope Spot Newsletter Update



Beach Cleanup HopeSpot: Hatteras Community Education Event

IUCN and Mission Blue (an organisation founded by Dr. Sylvia Earle) have formed a partnership to create a formal process for designating Hope Spots across the globe. These areas are parts of the ocean that deserve protection for their special features and ecosystems. The Hope Spot process is unique in that nominations can come from any source – a distinctive feature of the global marine protection effort.

A nomination system and council are currently being set up to assess public nominations and, if successful, place them on the world map of Hope Spots. To inform whether an area can be formally recognised as a Hope Spot, it must meet a set of criteria:

- A site of special abundance or diversity of species;
- Containing special, unusual or representative species, habitats or ecosystems; and
- Holding significant economic, historical, cultural or spiritual values.

The Hope Spots council is composed of regional marine experts well-placed to review and accept nominations. Dr. Earle, the council and Mission Blue will provide on-going support to new Hope Spots by increasing visibility, supplying expert knowledge, and helping to build a network of supporters and advocates to uphold future legal efforts. Along with other media tools, the first edition of the “Hope Spot Sentinel” newsletter will be launched, containing stories and pictures of these remarkable places from around the world. Both Mission Blue and Dr. Earle have built a large and influential online presence, together with the release of the film ‘Mission Blue’, chronicling Dr. Earle’s life and her vision for Hope Spots.

Once these systems are up and running, they will act as a platform to advocate for legal and social protection of new Hope Spots via community support, education and the effective use of social media tools. As Dr. Earle ex-

plains, the Mission Blue effort works on the expectation that “a global network of Hope Spots will protect and restore a healthy ocean.”

North Carolina, on the East coast of the United States, harbours an inspiring example. The proposed Hope Spot site is the Outer Banks, a series of barrier islands that are home to a wide range of coastal habitats. Each island supports a large range of species, including several that are threatened, such as the loggerhead turtle (*Caretta caretta*) and the piping plover (*Charadrius melodus*). The Hope Spot: Hatteras project was first proposed by a university professor and a group of her students. Even in advance of receiving approval, the group have raised funding and recruited volunteers from local communities, undertaken beach clean-up operations, produced a short film and launched a website to raise visibility and public support for their nomination.

There are currently 61 Hope Spots in place, some with legal protection (such as the Chagos Archipelago) and others without. The success of Mission Blue’s media outreach has resulted in the receipt of several hundred nominations, from members of the public with a deep-rooted love for their local coastline, to highly dynamic and integrated communities. With the nomination system soon to be in place, chances are that many important sites will soon become fully-fledged Hope Spots, continuing to inspire visitors and locals alike to protect and respect unique patches of ocean.

For more information, please contact Raphaëlle Flint (Raphaëlle.flint@iucn.org)

Stay connected with the Global Marine Community

For over a decade, the Global Marine Community (Formerly DCMC) has fostered an informal and non-partisan platform to promote understanding of key issues and challenges while building partnerships across an increasingly diverse group of marine conservation professionals and students. Signing up for the free IUCN Global Marine Community weekly newsletter will get you a weekly round-up of upcoming events, webinars, meetings, recent reports, funding opportunities, photo of the week, and a jobs list.

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Sustainability of Fish Feed in Aquaculture

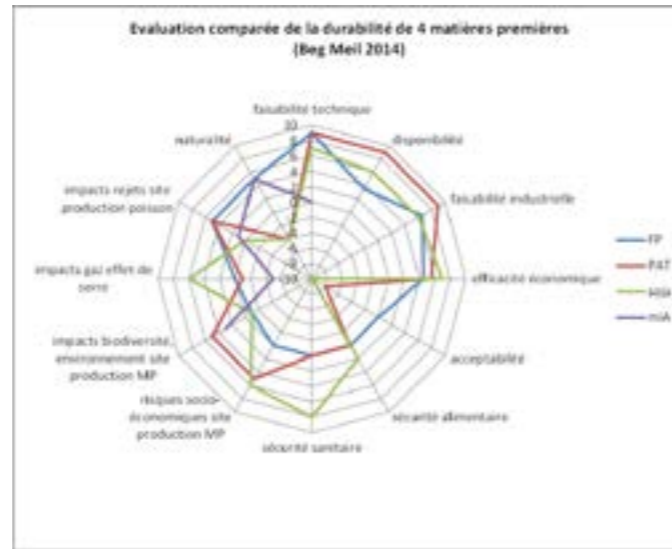
In 2016, total aquaculture production intended for human consumption is expected to exceed global fishery production. Within this global picture, fish farming is developing quickly, both for freshwater and marine species. Breeding fish, however, also requires feeding them.

Fish feed is formulated using a diverse range of sources of proteins and lipids. A large part of this comes from fish meal, made mainly from a mixture of whole fish (mainly small, foraging fish species, such as the anchoveta – from the portion not directly consumed by humans) and fishery processing by-products from processing. However, many other foodstuffs are used to manufacture the meal and formulate the feeds, including soya, corn, wheat, seaweed, and terrestrial animal by-products from the food processing industry. Regardless of the mixture of sources used, fish feed production remains plagued by sustainability issues, including its impact on biodiversity, natural resource availability, social acceptability and industrial feasibility.

IUCN's Global Marine and Polar Programme (GMPP) and the Commission on Ecosystem Management – Ecosystem-based Aquaculture Group (CEM E-bAG) has been tackling this complex issue in collaboration with the animal feed industry and the aquaculture sector, with the support of the Directorate of Fisheries and Aquaculture of the French Ministry of Environment.

Several workshops have been organised, and a report has been drafted incorporating the best available knowledge. All protein and lipid sources have been assessed from environmental, social and economic sustainability standpoints, and recommendations have been agreed.

Looking to the future, a number of alternatives are available, including protein from insects and worms, and proteins and lipids from micro- and macro-algae. The latter is the most promising, given that algae culture is the most sustainable in terms of environmental



Preliminary results of sustainability analysis for fish feed sources (FP = fish protein, PAT = terrestrial animal protein, miA = micro-algae)

impact. Algae-based fish feed, or 'vegetarianism for fish' can also provide all the required nutritional components of fish food.

In addition to being a "glocal" phenomenon – implementing global principles at the local level – sustainability in fish feed extends far beyond the ecosystem level. Agro-ecology, circular economy dynamics, life-cycle analysis, traceability and source certification are all relevant to achieving sustainable fish feed management.

For more information, please contact François Simard (francois.simard@iucn.org).

Recommendations

- Fish meal and fish oil from dedicated fisheries: ensure they are sourced from fisheries and processing plants certified by, e.g. the Marine Stewardship Council (MSC), and from countries that have sustainable fisheries management regulations in place.
- Fish meal and fish oil from fishery and aquaculture by-products: ensure the upstream sustainability of by-products and optimise the use of discarded product. Explore the use of by-products at the local level and the potential for circular economies of production and consumption. Ensure by-products are subject to strong traceability standards.
- Terrestrial vegetal proteins: ensure the sustainability of primary production processes (since the vast majority of vegetal proteins are agricultural by-products). This is particularly relevant to soy bean and palm oil production, and feeds back into much larger debates on sustainable agriculture, including the use of GMOs.
- Terrestrial animal proteins: similarly to vegetal proteins, the primary issue is the sustainability of the meat industry. The issue of social acceptability of using particular animal proteins (feed made using blood, skin, bones and feathers) to feed fish must also be confronted.

Aquaculture and Marine Protected Areas



Aquaculture is likely to be an expanding industry over the coming years. The need to feed a growing world population is an ever-greater and more pressing challenge. One of the major constraints to aquaculture growth, however, is limited availability of, and access to, space. Competition with other marine activities is intense, primarily because the bulk of marine aquaculture is located close to the shore. The cultivation of fish, shellfish and algae requires high-quality water, but coastal waters are often of insufficient quality to support the production of food with high nutritional content.

In order to provide ecosystem goods and services, such as carbon sequestration, oxygen production, and good quality water, it is necessary to conserve healthy ecosystems. A popular means of doing so is the establishment of Marine Protected Areas (MPAs). Aquaculture is often seen to pose pollution risks, while MPAs are generally regarded as no-take zones (no fishing, mining or drilling).

Good examples of aquaculture employ a range of sustainable practices, however, and there are six categories of MPA, of which only one is no-take. In acknowledging that aquaculture requires good quality water, and that MPAs need to be economically viable, it is possible to reconcile the two in pursuit of the overall goal of sustainable development.

To this end, IUCN's Global Marine and Polar Programme (GMPP) and World Commission on Protected Areas (WCPA) are exploring synergies between aquaculture (across all types) and MPAs (across all MPA categories and their various management objectives). In collaboration with several partners (including FAO, GFCM, Blue Ventures, IFREMER, Agence des Aires Marines, and several universities), the project aims to identify and pursue positive interactions between aquaculture and MPAs.

The main question being tackled currently is how MPAs can support aquaculture growth and how aquaculture activities might support MPAs, minimising the negative side-effects of one on the other. Forthcoming discussions will cover different kinds of interactions, positive and negative effects, sustainability patterns, lessons learned from previous experiences, pitfalls, drawbacks and, finally, concrete recommendations.

Drawing on a series of case studies, the project will deliver a technical brief setting out the main principles for reflecting on aquaculture-MPA synergies, and providing an ethical and practical framework for implementing sustainable aquaculture in MPAs. The report will introduce and discuss the value of different aquaculture types within an MPA: small-scale aquaculture; community-based aquaculture, integrated multi-trophic aquaculture, aquaculture-oriented MPAs and MPA-labelled aquaculture. It will also identify links with other labels (ASC, Fair Trade, Organic, Label Rouge, Slow Food).

The report will also consider whether some types of aquaculture should be excluded from MPAs (particularly industrial-scale carnivorous fish cages), and whether it is best to adopt a framework, targeted approach or a set of general principles. A matrix comparing the various types of aquaculture and the MPA categories, and the interactions between them, will also be developed.

To meet Aichi Target 11 (10% of the oceans in effectively managed MPAs by 2020) and Sustainable Development Goal 2 (end hunger, achieve food security and improved nutrition and promote sustainable agriculture), we will have to reconcile nature conservation and sustainable development. Applying the ecosystem approach to marine activities such as aquaculture is an important step towards this goal.

For more information, please contact François Simard (francois.simard@iucn.org)



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Proposed activities for IUCN/CEM/FEG 2016

Working as always at the interface between fisheries and conservation, the IUCN Fisheries Expert Group (FEG) will focus on completing the numerous activities undertaken in the last 2 years, and, in particular, finishing and publishing the outcomes of its scientific workshops.

The FEG will also continue to present in international fora the conclusions of its work on (i) Balanced Harvest; (ii) MPAs and fisheries; (iii) global governance of fisheries and conservation; (iv) payments for ecosystem services; and (v) financial instruments for by-catch mitigation, contributing to clarifying the issues emerging in the ongoing global reform process. Finally, FEG will continue to look for opportunities to stimulate and participate in international collaborative initiatives aiming at sustainable use of ocean living resources involving environmental and fisheries organizations such as FAO, IUCN and CBD as well as GEF and World Bank.

2016 is an exceptionally busy year for fisheries and marine conservation with many important international events such as FAO/COFI, the CBD/SBSTTA and COP, the IUCN World Conservation Congress, and the CITES COP. Below is a brief description of the upcoming events and ongoing processes in which FEG has been or will be actively contributing, and proposed activities.

Collaboration with FAO and the CBD

FEG continued its close collaboration with intergovernmental bodies and NGOs, including participating in the FAO Project "Common Oceans", within which the FEG is a partner. FEG also contributed to the process of elaboration of the FAO Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries (SSF) and collaborated with the FAO and the CBD to conclude an agreement on Aichi Biodiversity Target 6, which aims to Improve Progress Reporting and Facilitate Implementation.

Think Tank Activities

The FEG responded to the recent high-level of interest in governance by promoting discussions on the topic, focusing particularly on the BBNJ Ad Hoc working group. The FEG, alongside IUCN and the US National Marine Fisheries Services, also participated in the elaboration of a book on Financial Instruments to mitigate the impacts of fisheries by-catch on biodiversity, to bring together all instruments and issues to propose least-cost conservation and mitigation strategies, as well as to promote increased involvement with the fishery sector in the design of solutions. Other activities in this area included working with IUCN to decide on the components of the situation analysis to be undertaken by IUCN, to identify consultants and clarify operational aspects.

The FEG also pursued the preparation for a special Theme issue of the ICES Journal for Marine Science on balanced Harvest following the request for submissions in April 2014, working to present the current thought on the concept through eight papers.

It has been agreed with FAO to produce a FAO/FEG technical paper on the best presentations made in Sydney about MPAs, fisheries, livelihoods and food security. This book, containing thematic issues and case studies, is almost ready for publication and is being jointly elaborated by FAO and FEG (led by Lena Westlund and A. Charles).

Overall, it has been a productive year for the FEG with multiple product outputs as well as valuable and interesting discussions on the wide range of issues that are related to fisheries.

For more information, please contact Serge Garcia (grcsgm@gmail.com) or Despina Symons (despina.symons@ebcd.org)

Environmental Science

2016 has seen the preparation and dissemination of key documents on the Mediterranean region and specific countries within it. Knowledge production is therefore taking centre stage as the key support structure for informed decision making. In particular, progress this year has been centred on discussions around a Deep Sea Science and Conservation Strategy; review of the international and regional conservation labels applicable in the Mediterranean Sea; a first edition of the Atlas of Mediterranean Seamounts designed to support deep sea conservation efforts; assessment of MPA legislation in Albania, Croatia and Montenegro; the first steps towards the establishment of a biodiversity platform; the development of a geoportal for the Alboran Sea including over 100 Geographic Information System (GIS) layers; the first Atlas of the Seagrasses of Spain; the development of the Mediterranean Marine Invasive Species (MEDMIS) application; and first steps towards compiling and maintaining a red list for Mediterranean marine ecosystems.

From Environmental Science to Environmental Policy

An alliance between all regional organisations for supporting and coordinating efforts for nature conservation and sustainable use of marine resources in the Mediterranean is being formed, involving the following partners, with more to join as the project develops:

- UNEP Mediterranean Action Plan (Secretariat of the Barcelona Convention)
- General Fisheries Commission for the Mediterranean (GFCM-FAO)

- Agreement for the Conservation of Cetaceans in the Black and Mediterranean Seas (ACCOBAMS)
- IUCN Centre for Mediterranean Cooperation
- Mediterranean Protected Areas Network (MedPAN)

Science and Policy Communication for the Public

IUCN's Centre for Mediterranean Cooperation, EFE Agency, Alliance of Mediterranean News Agencies (AMAN) and fourteen press agencies (50 participants from 15 countries) convened in Málaga with some of the strongest regional environmental organizations to find an answer to the challenges facing environmental reporting in the Mediterranean. The conclusions of two days of debate on the subject were subsequently codified through the Málaga Declaration. The Declaration, endorsed by all participants of the meeting, advocates for the establishment of a partnership to provide cooperation mechanisms for environmental and scientific information professionals operating in Mediterranean countries. The creation of a media network to promote better-coordinated, high-quality scientific and environmental press coverage at the Mediterranean level is one of the key objectives identified. A "journalist's" guide to key questions and institutions is the first product of this alliance.

All related documents and more can be found at <http://bit.ly/IUCN-MedPublication>. Please contact the IUCN Centre for Mediterranean Cooperation for more information: Alain.Jeudy@iucn.org (Marine Department) or Lourdes.Lazaro@iucn.org (Corporate department).

Thailand Takes Action to Save Coral Reefs amidst Looming Climate Change Threats

Thailand's Department of Marine and Coastal Resources (DMCR), in cooperation with the Department of National Parks, Wildlife and Plant Conservation (DNP), IUCN and other partners, has launched a framework for proactive monitoring and management of coral bleaching to minimise the impacts of climate change in critical marine areas. The measures include the temporary closure of several diving sites in order to protect important reef areas.

Coral reefs, along with seagrass beds, mangrove forests and other tropical marine environments, are critical habitats that support the highest concentrations of marine biodiversity in the world. They provide feeding, nursery and spawning grounds for a wide variety of marine life and protect the coastline from severe storms and rises in sea level. Over 500 million people worldwide depend on them for food, storm protection, jobs, and recreation. Coral reefs are extremely sensitive to small increases in ocean temperature and acidity, making them some of the most vulnerable ecosystems to climate change.

A resilience-based approach has been put in place by DMCR, DNP, IUCN and partners. This aims to foster public discourse on coral bleaching, redesign marine protected areas networks and temporarily close popular diving sites in order to minimise human disturbances and give coral reefs the chance to cope with severe stresses. This is in response to the devastating effects of the third global coral bleaching event on the northern part of Australia's Great Barrier Reef, Hawai'i and elsewhere.

Thailand has been regularly experiencing major coral bleaching since 1991, with severe coral bleaching taking place in 1995, 1998 and 2010. This has left much of the once-pristine coral areas in the Andaman Sea and the Gulf of Thailand in critical condition. While many of the reefs are well on the recovery trajectory, the current global bleaching event could further degrade their conditions, ultimately affecting coastal community livelihoods as well as the tourism sector.

Collaboration between DMCR and IUCN

"The sea surface temperature throughout Thailand during the hot season this year has been ranging from 30-33°C. This is significantly above Thailand's coral reef current threshold for bleaching at 30.5°C. If temperatures remains the same, or rise, it is predicted that widespread bleaching will occur in up to 80% of coral reefs in the country. A taskforce consisting of DMCR, other relevant government agencies, universities and IUCN has been formed to provide concrete recommendations for swift management actions," said Dr. Pinsak Suraswadi, Director of the Marine and Coastal Resources Research Institute, DMCR.

DMCR has been monitoring the situation closely. It began assessing coral reef resilience throughout Thailand based on the new guidelines jointly developed by Thai marine scientists and IUCN last November. DMCR scientists, in collaboration with DNP, applied customised resilience indicators based on the standard protocol for coral reef assessment recommended by IUCN. The results will help to identify critical areas in need of protection and assess resilience levels across the reef ecosystem. The comprehensive response plan includes a dedicated coral bleaching warning system website which provides daily updates on the coral situation in Thailand. Launched in February, the information portal presents users with real-time sea surface temperatures, and also comprises a reporting channel that features marine-related information gathered from various stakeholders on the ground.

In June 2016, the fifth National Marine Science Symposium, held in Bangkok, brought together over 700 marine scientists, park managers and policy makers around the country to discuss medium and long-term coral bleaching intervention options that help coral reefs cope with more frequent elevated sea temperatures. In his keynote address, entitled 'Keeping the blue – green', Professor Marc Hockings of the University of Queensland and Vice-Chair of IUCN WCPA's global programme on Science and Management of Protected Areas, emphasised the importance of improving standards of marine protected areas as an essential component of improving resilience to climate change. Professor Hockings also introduced IUCN's Green List of Protected Areas, an initiative that measures, shares, encourages and celebrates protected areas that successfully reach good standards of management. IUCN had previously assisted Thailand's DNP in evaluating management effectiveness of 22 marine protected areas. Discussions on the application of the 'Green List' concept to the country's protected areas are also under way.

"Building ecological resilience through the development of marine protected area networks is key in helping corals fight climate change. Crises such as coral bleaching events have captured a lot of public interest and we have seen policy changes and strong measures being implemented here in Thailand to mitigate the current impact. IUCN congratulates Thailand for developing a comprehensive and proactive management plan in response to the coral bleaching event. IUCN will continue to support the work carried out by the government of Thailand in minimizing the impact of this global event," said Mr Petch Manopawit, Deputy Head of IUCN Southeast Asia Group.

The peak of El Niño has passed and sea surface temperatures in Thailand have now returned to normal. Many bleached corals are now on the route to recovery,

and mortality appears to be minimal in most protected areas in Thailand. It appears that with some luck in the pattern of temperature fluctuations, proactive measures have paid off and are helping to buy some time for nature to adapt.

DMCR and IUCN have been partners in conservation since 2002, collaborating on numerous projects, including Mangroves for the Future (MFF), Mangrove and Markets (MAM), Ecosystems Protecting Infrastructure and Communities (EPIC) and the Trans-boundary Dolphin Conservation project. In 2016, IUCN signed an MoU with DMCR to improve marine and coastal conservation in Thailand and to ensure that conservation and enforcement tools under the newly adopted Promotion of Marine and Coastal Resources Management Act are implemented to the benefit of coastal communities and ecosystems.

Temporary Closure of Reef Areas

The coral bleaching response taskforce has proposed the temporary closure of 32 sensitive reef areas, 15 of which are located in the Andaman Sea, and 17 in the Gulf of Thailand. These measures are intended to minimise human impacts and maximise protection of source areas. The protected areas include famous diving sites such as the east coast of Mu Ko Similan National Park and Mu Ko Surin National Park in Phang Nga; Ko Yung and Ko Phai in Mu Ko Phi Phi National Park in Krabi; Ko Aew in Phuket; Ko Adang Rawi in Satun; Ko Talu in Prachuap Khiri Khan; and the northern part of Ko Pha-Ngan and Ko Samui in Surat Thani. The proposed period of closure of one year will be reviewed, and further notice given, once detailed monitoring and reporting has taken place.

For more information, please contact Angela Joehl Cadena (angela.joehlcadena@iucn.org) or Petch Manopawit (petch.manopawit@iucn.org).

Previously unknown ocean values motivate EEZ-wide planning in Pacific Island countries

More than 95% of most Pacific Island nations are covered by ocean. Recent studies show that the marine environment provides ecosystem services worth billions of dollars to Pacific Island economies and people.

Only a small part of this value is reflected in the formal marketplace. The majority of the value of marine ecosystems services is not bought or sold; they reflect the intangible benefits of the marine environment to Pacific Island cultures, food, coastal protection, climate change impact mitigation, and more. Pacific Island leaders are spearheading global efforts to consider the full range of values of their marine resources in making more balanced, more sustainable decisions. IUCN is supporting these efforts in close collaboration with SPREP and GIZ through the Marine and Coastal Biodiversity Management (MACBIO) Project, funded by the German Federal Ministry of Environment.

Reflecting the crucial importance of the ocean to Pacific Islanders, a range of different approaches has traditionally been applied to manage coastal ocean spaces – for example, by declaring temporary or longer-term “tabo” or no-take areas hundreds of years ago.

Higher mobility, increasing populations, as well as the far-reaching impact of globalisation, make it even more important to promote sustainable resource use in appropriate places, to minimise conflict over resources, to protect biodiversity and to carefully control marine resource uses. Ocean-wide spatial planning provides new tools that Fiji, the Solomon Islands, Tonga and Vanuatu are bringing to bear, supported by MACBIO, to safeguard the future of the Pacific

Ocean, and in doing so, protect their people.

The Cook Islands are also exploring the options and opportunities of large-scale ocean planning within its Marae Moana (Marine Park). IUCN has been able to support these efforts with funding from Global Blue through spatial data compilation and legal analysis.

Managing huge marine protected areas brings unique challenges. IUCN, with support from the US Embassy, was able to convene a meeting of managers of some of the largest open ocean spaces in the world (Kiribati, USA, New Caledonia and the Cook Islands) – to share lessons learned and strengthen cooperation in areas such as capacity building of management committees, policy reviews, sustainable financing mechanisms, research, surveillance and enforcement.

Across the Pacific, there is also a keen awareness that the future of Pacific Island countries lies with their youth. With support from the US Embassy in Fiji, IUCN convened an Emerging Ocean Leaders’ Conference in Suva which saw over 30 young Pacific Islander professionals build knowledge, networks and capacity to better support their countries in all aspects of marine resource management. Topics addressed and debated included fisheries, marine spatial planning, communications and social networking as a management tool.

For more information, please contact Leanne Fernandes (Leanne.Fernandes@iucn.org) or Katrina Davey (Katrina.Davey@iucn.org).

West Africa: development of an observation mechanism for the West African Coastline

Coastal erosion is the breaking down of land and beach sediments by wave action, currents and high wind. These processes, and the resulting changes to the shoreline, bear social and economic consequences that have been observed in West Africa for many decades.

The impact of erosion, exacerbated by climate change and of increasing relevance to coastal populations, has already been identified by several pan-African ministerial conferences, notably in 1997 at the Conference of Ministers of the Environment within the West African Economic and Monetary Union, better known by its French acronym, UEMOA. In April 2007, this same conference launched a Regional Program to Combat Coastal Erosion in West Africa.

In 2009, UEMOA, responding to demands from partner states, partnered with IUCN to implement a Prevention Plan on coastal risks and a Master Plan for the West African Coastline (SDLAO in French). In May 2011, Ministers of the Environment from eleven West African countries adopted the Dakar Declaration, bringing the SDLAO into existence and demonstrat-

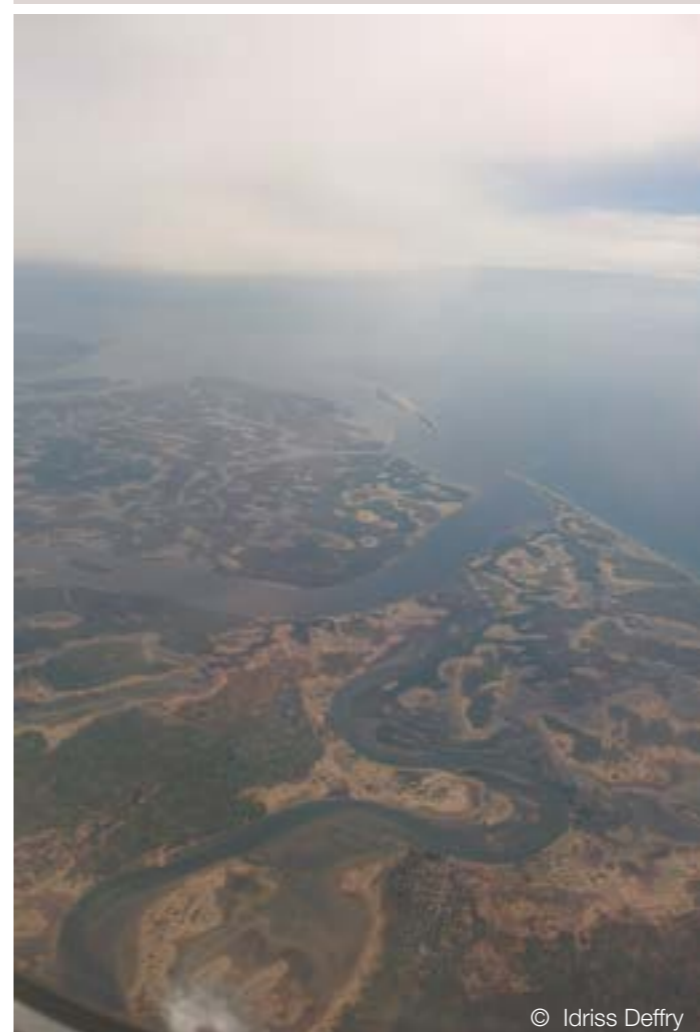
ing a will to pool resources to realise the common goal of creating a regional shoreline monitoring mechanism. This initiative was recommended in response to alarming increases in the scale of economic and social costs of coastal erosion in West Africa, made worse by the pressure of growing coastal populations and infrastructures, and in light of various different manifestations of climate change.

In 2012, the West African Observation Coast Mission (WACOM; MOLOA in French) was established with the financial support of UEMOA. An effective operating system has been developed over the last three years, establishing national branches in each of the eleven signatory states to monitor the risks of coastal erosion and how they evolve. The Centre for Ecological Monitoring in Dakar handles the regional coordination of the monitoring mechanism, with the support of the Marine and Coastal Programme of IUCN for Central and West Africa (IUCN-MACO).

WACOM is currently preparing its first “Evaluation of West African Coasts” report, allowing it to share important developments, identify areas subject to particular stresses, and catalogue responses from governments, intergovernmental organisations and partners since the publication/release of the SDLAO Master Plan in 2011. The report findings are expected to be adopted at the meeting of Ministers of the Environment organised by UEMOA in 2016.

The WACOM mechanism is being designed in collaboration with a diverse number of partners, including the World Bank and ClimDev-Africa. In the coming years, it should reinvigorate and mobilise national bases, diversify the network of observers (including local authorities, coastal villages and managers of protected areas) and standardise reporting systems. Another important communicative tool will be the bi-annual publication of Evaluation of West African Coasts reports, and to construct partnerships around decentralised cooperation, as well as with other organisations and regional networks engaged in similar projects around the world.

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The World Commission on Protected Areas Marine: making a big splash for the future of our ocean

The 2014 World Parks Congress in Sydney saw a significant scaling-up of recognition of ocean issues by IUCN, WCPA-Marine and partners. Since then, much has taken place behind the scenes to expand WCPA-Marine action areas, whilst strengthening existing programmes, membership services and visibility. This article provides a few highlights to illustrate the breadth and depth of its ocean conservation, protection and management work.

WCPA-Marine has been focused on many areas, building on the momentum of 2014 by conducting outreach on the marine components of the **Promise of Sydney**. It gathers, writes and distributes updates on key milestones to partners, promoting awareness of – and progress on – Sydney’s marine recommendations.

It has been a remarkable time for the development and strengthening of **Important Marine Mammal Areas (IMMAs)** by the joint WCPA-Marine/Species Survival Commission Marine Mammal MPA Task Force. Following work on agreeing criteria for IMMA identification, funding was obtained by the MAVA foundation for the first workshop, in the Mediterranean. Shortly afterwards, funding was announced for the Task Force of expert workshops to identify IMMAs in five Southern Hemisphere regions (South Pacific; Southeast Pacific; waters around Australia and New Zealand; Northeast Indian; Northwest Indian). This forms part of a larger package of financial support for the Global Ocean Biodiversity Initiative (GOBI) provided by the German Federal Ministries for the Environment, Nature Conservation, Building and Nuclear Safety, through the joint Climate Change Initiative (IKI).

The WCPA-Marine Working Group on the **IUCN Green List of Protected and Conserved Areas (GLPCA)** was established in 2015 to ensure that MPAs are embedded within the overall IUCN GLPCA programme; that the MPA community is fully aware of the GLPCA’s role in promoting effective management of protected areas; and that MPAs are assisted and encouraged in achieving Green List status.

The Guidelines on the Design and Management of Large-Scale MPAs, to be launched in 2016, have

been prepared by the **Large-Scale Marine Protected Areas Task Force**, in partnership with Big Ocean. The guidelines have been developed following extensive consultation and peer review with IUCN Commission members. The Task Force has helped create a pioneering framework for gathering large-scale data on design and management plan development timelines. A landmark achievement of WCPA-Marine work with many partners in 2015 was ensuring the ocean featured in the **Paris Agreement**. Prior to COP21, oceans were generally sidelined in UN climate negotiations. In Paris, the mobilisation of civil society and scientific voices calling for the inclusion of oceans gave long-awaited prominence to the issue. The number of ocean stakeholders, boosted by French organisations within and outside the conference, has grown exponentially. The number of side events discussing ocean issues, such as acidification, island vulnerabilities and blue carbon, has seen a threefold increase.

WCPA-Marine efforts at COP21 were reinforced by the newly established **WCPA Marine Young Professionals Task Force (YPTF)**. The YPTF’s primary objective is to engage the next generation in supporting ocean conservation and MPAs, through innovative and creative outreach and communication activities. The Task Force’s first deliverable was released at COP21: an ocean and climate infographic, the first in a series highlighting the role of MPAs in combating climate change. It was published online during the COP21 Ocean Day under the hashtag #FutureOceanLeaders. Social media activity during the conference reached 1.8 million Twitter users, with a total reach of well over 2 million through additional shares on Facebook and other media.

WCPA-Marine is also involved in the MPA Agency Partnership, a forum of senior government officials providing opportunities for global leadership on MPAs, collaborative problem solving and collective contributions to global marine conservation. The Partnership provides a space for discussion, research and strategic planning with the core agencies responsible for delivery of three-quarters of the MPA areas achieved under Aichi Target 11.

In January 2016, a UN Working Group agreed to discuss the development of a legally-binding agreement to facilitate, among other things, the establishment of MPAs in the High Seas. The January Working Group’s consensus recommendation was the outcome of over a decade of coordinated efforts by the **WCPA High Seas MPA Specialist Group**, the IUCN World Commission on Environmental Law, the High Seas Alliance and many others.

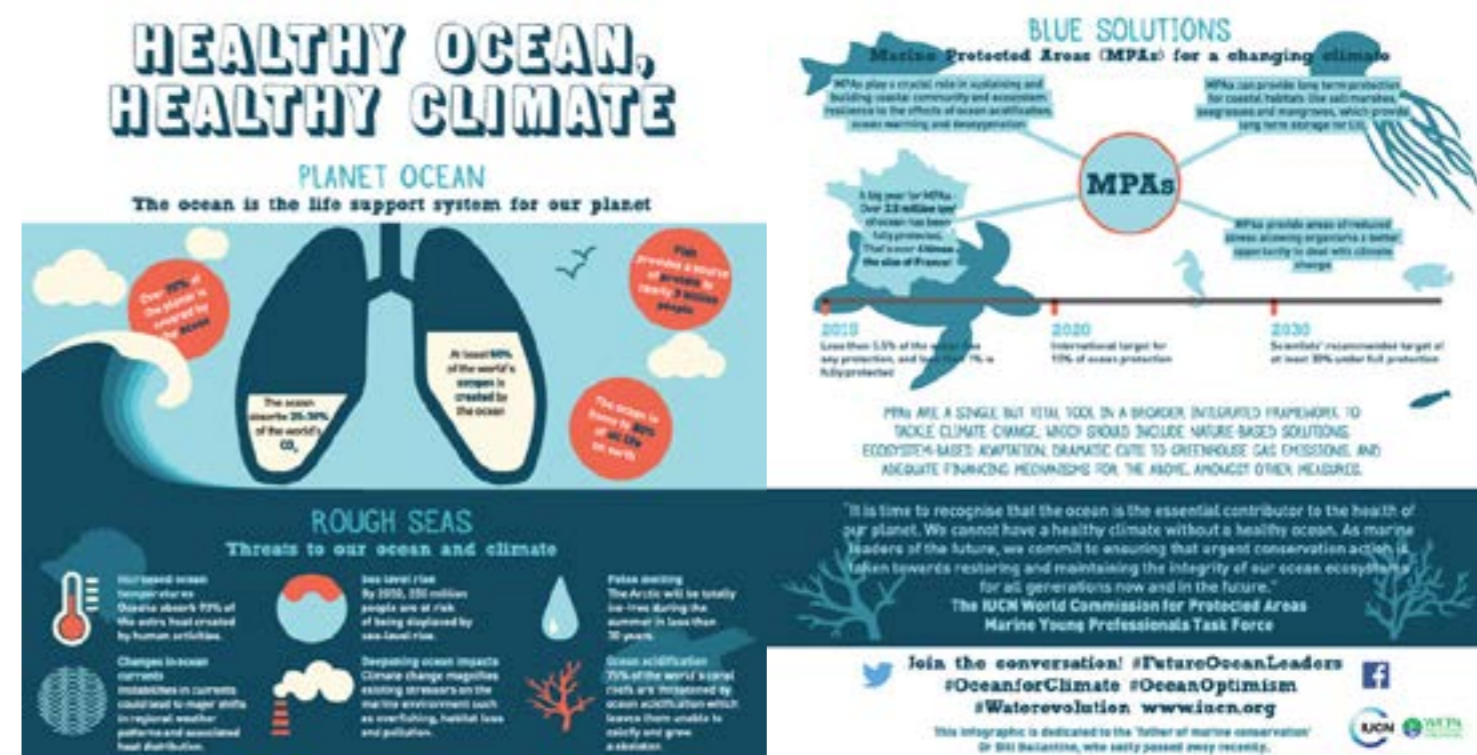
Capturing new knowledge on MPAs on behalf of the international community has also become a key priority for WCPA-Marine. Not only does this ensure that

important information is placed in peer-review publications, it also builds linkages between key global MPA stakeholders. WCPA-Marine has an agreement in place with Aquatic Conservation, an international scientific journal, to publish special issues on IUCN’s major global events focusing on MPAs.

These achievements are just part of the wider work being undertaken by WCPA-Marine members, covering issues as diverse as ocean acidification, blue carbon and aquaculture. The One Programme initiative continues to thrive and strengthen with the support of other Commissions, the Global Protected Areas Programme, and the Global Marine and Polar Programme. Plans are in motion for the Fourth International Marine Protected Areas Congress in La Serena, Chile from 4th - 7th September 2017, with a focus on ‘Inspiring New Generations’.

For more information, please contact Dan Laffoley (danlaffoley@btinternet.com) or Marisol Bianco (mariasole.bianco@hotmail.com).

The latest Special issue of Aquatic Conservation – ‘Building Networks of MPAs: The Legacy from the 2014 Sydney World Parks Congress’ – is scheduled for launch on 6th September at the World Conservation Congress in Hawaii. The issue contains 15 papers covering many of the key issues discussed in Sydney, including connecting people to nature, MPA management and the challenges of protecting the high seas. Planning for the next Special Issue is already underway – it faces a challenging set of deadlines to be published in time for launch at IMPAC4 in Chile in September 2017. Possible topics include MPAs and blue carbon, MPAs and the high seas, MPAs and Aichi Targets, and MPAs and climate change, but the full contents are still being developed and suggestions and offers of papers are welcome. The Special Issues were conceived to give people who might not otherwise publish peer-reviewed literature the opportunity to share their expertise and experiences with a much wider audience. This success of this initiative is clearly illustrated by the fact that ten of the top downloaded papers for Aquatic Conservation in 2015 were published in the first Special Issue series from the IMPAC3.



Marine species Red Listing: Full speed ahead

Red listing marine species is a global conservation priority – yet knowledge on the conservation status of marine species lags far behind that of terrestrial species. Only 13% of the species on the 2016 IUCN Red List of Threatened Species utilise marine environments.

The Global Marine Species Assessment (GMSA) project was launched in 2005 to increase the representation of marine biodiversity on the Red List, and particularly to attract attention to marine fish, invertebrate and plant species. In 10 years, we went from 400 marine species assessed prior to 2005, to over 11,800 species today, with a target of 20,000 species by 2025. The results of this effort have been communicated in the scientific literature in more than 25 peer-reviewed publications authored by GMSA members and IUCN Species Specialist Groups, and many more led by others in the scientific community.

Although the primary threat to biodiversity in the terrestrial realm is habitat loss, marine biodiversity is mostly threatened by overexploitation. Several characteristics can make species particularly susceptible to overfishing, from longevity and delayed sexual maturation to aggregating (congregatory) behaviour (for example, for spawning) and high economic value. In addition, mismanagement of many commercially-harvested species has resulted in heavily depleted populations. Lack of information and monitoring on many such species has frustrated accurate assessments of extinction risk.

Increasing marine representation on the Red List

Over the past 10 years, it has become clear that the marine conservation community needs to know much more about fish – particularly bony fish. Among marine vertebrates (about 18,000 species), there is now considerable knowledge on the conservation status of marine mammals (126 species), pelagic sea birds (346 species), marine turtles (7 species) and cartilaginous fish (sharks, rays and chimaeras: about 1,100 species). Of the 16,000 species of bony

fish, the GMSA has assessed more than 6,500, in a range of taxonomic groups. Of these, more than 300 species are listed as threatened (Critically Endangered, Endangered or Vulnerable), including charismatic and commercially-fished species, such as tuna and billfish, groupers, parrotfish, wrasses and sea breams. In general, larger and longer-lived species are of higher conservation concern than their smaller, short-lived counterparts.

We now know much more about seagrasses and mangroves. Of 138 species assessed, 21 are in threatened conservation categories. Several invertebrate groups, such as cone snails and sea cucumbers, have also been evaluated. Of these, commercially-exploited and restricted-range species tend to be more threatened. Most alarming is the status of reef-building corals, around which enormous biodiversity revolves. Almost one-third of the 845 recognised species are threatened, due to a combination of climate change and local threats.

As we have come to understand vulnerabilities to exploitation and increasing commercial pressure to overfish, the groups in most need of assessment have become those fish and invertebrate species targeted by fisheries. Fisheries extract about 80 million tons of biomass from the oceans each year. In 2012, the five most important species by biomass were Peruvian anchovy, Alaskan (walleye) pollock, Skipjack tuna, various sardinellas, and Atlantic herring. Highly valuable species are also fished in large quantities, from Bluefin tuna and Chilean sea bass to less well known, but threatened, species such as the Chinese Bahaba and the Totoaba.

Only a small proportion of the species targeted by fisheries have been assessed. Of the 163 species with formal stock assessments, only 72 have been assessed using Red List criteria. 19 are listed as threatened, and another 9 as Near Threatened. This reflects the complexities in determining the conservation status of species that sustain economic interests, and the relatively larger time and effort required to obtain and aggregate catch data. Anchovies, sardines and herrings, for instance, form a key link in coastal food webs between plankton and higher-level predators. These so-called “forage fish” are heavily exploited. The abundance of these species is often highly variable and unpredictable, and despite occasional massive abundances, overfishing can cause population collapses from which they do not always quickly recover. Given their economic and ecological importance, all species of forage fish will be assessed as part of a recent partnership between IUCN and Toyota Motor Corporation Foundation.

The cost of Red Listing a marine species

Red Listing is a cooperative effort. International experts, including taxonomists, biologists, fisheries scientists and many others, attend workshops to review species-specific data against the quantitative Red List categories and criteria, and determine the extinction risk of each species. The average cost of this process is estimated at approximately 500 USD per species. Species of high commercial value (for example, tuna and billfish) are more expensive to assess than others, as additional experts and consultations are needed. The GMSA has been involved in 61 workshops since 2005, with more than 500 specialists volunteering their time and expertise. This equates to an investment of at least 3 million USD on marine Red Listing by international institutions. The benefits of red listing workshops go far beyond the actual assessments, and are crucial for raising awareness around the conservation of marine species; increasing international collaboration amongst scientists, conservationists and resource managers; and training governments and agencies in understanding and using Red List assessments at national, regional or global scales.

Tackling overexploitation

On land, wild animals provide only a small proportion of humans’ food sources. This is not the case in the oceans. According to the Marine Stewardship Council, fish provides more than 3 billion people with 20% of their animal protein, and another 4.3 billion people with 15 % of animal protein. While aquaculture continues to grow and will become more important to the supply of marine living resources than fishing natural populations, fisheries still represent about half of total production. Moreover, aquaculture will not necessarily prevent overexploitation, since wild-caught fish are a major component of fish feed in aquaculture installations. In addition, an estimated 35% or more of reported catch is discarded. These discards are generally unintentional catches (often undersized individuals of target species, or non-target species with no commercial value) that go back into the oceans as waste. The IUCN Marine Conservation Sub-Committee is prioritising plans for a situational analysis of species frequently taken as ‘bycatch’ (or ‘trash fish’ in Asia). These fish are increasingly targeted by trawlers as organic matter for the mariculture industry, as well as for processed food (fish balls and surimi) in an unsustainable, non-selective fashion.

For more information, please contact Yvonne Sadovy (ysadovy@hkucc.hku.hk) or Claudio Campagna (ccampagna@wcs.org).

How Protected is your Marine Protected Area ?

Child of the Sea

I have been diving since before I could walk and virtually grew up in the sea. Over the last four decades, I have been fortunate to be diving in some of the most amazing dive sites on the planet, many of which are marine protected areas (MPAs) or hope spots. Unfortunately, I have also gone diving in spots that do not inspire hope but rather incite despair and frustration in the face of how we are capable of mistreating the oceans. Seeing these spots, motivated me to start speaking out about the state of our oceans and the importance of protecting them.

I have been diving in areas that, while listed as MPAs, have little improved ecosystem richness compared to other unprotect- ed areas.

This should tell us that simply giving a location a rubber stamp and making it a marine protected area on paper does not guarantee an improved vitality and health of the area. What is required is proper management, enforcement and support from the local government and the local community.

Cabo Pulmo marine reserve

It was more than 25 years ago that I dove here for the first time. Back then it was a remote location that you only found by accident on a lonely dirt road after driving for several hours. I was told that it was a protected area and that you could not fish or hunt within it, but that unfortunately people did anyway.

At that time, the area was vital and full of sea life, but nothing like it is today. So, when I had the opportunity to head back there and dive to support a bull shark (*Carcharhinus leucas*) tagging expedition, I was a bit surprised at the superlatives that were thrown our way about the area. The scientific team was raving about this marine reserve as being such an incredible and rich place, and although I knew it to be quite vital, I was not prepared for what I was about to see.

When we arrived to Cabo Pulmo we found a small but thriving little village of locals who were living and earning their livelihood from a symbiotic relationship

with the marine protected area, taking people diving and enforcing the rules.

A sea full of life

The quantity and different kinds of species I dove with was staggering. As I was lying on the bottom of the ocean floor at 22 m depth, hoping for a bull shark, I felt something behind me. I turned slowly around to see a 60-kilo snapper about 1 foot away from my fins! Behind it, there were another two-dozen snappers, all surely wondering what this strange creature was. Behind the snapper was a massive grouper - at least 175 kilos, timidly looking at me behind the snappers, keeping a safe distance.

We later changed location by a few hundred metres to find the most enormous ball of fish I have ever seen - bigeye jacks (*Caranx sexfasciatus*), in formation. They followed us around as we dove, filming and photographing this amazing sight.

They day went on and on and even though we were getting tired, we did not want to stop. We also encountered mobula rays flying along the bottom, sea lions, more large schools of fish, bull sharks, more snappers and giant groupers – a truly never-ending parade of marine life.

As you can see in the photo, this place is a truly amazing dive site that shows how well and healthy the ocean could be, can be and will be if we just give it the room to breathe. It is in our best interest to protect the one thing that gives us life. I hope you enjoy the photos and that one day you will get to dive in the Cabo Pulmo marine reserve; a truly amazing example of conservation at work.

Text and photos by IUCN's Ocean Ambassador, **William Winram**.

New Publications and Reports

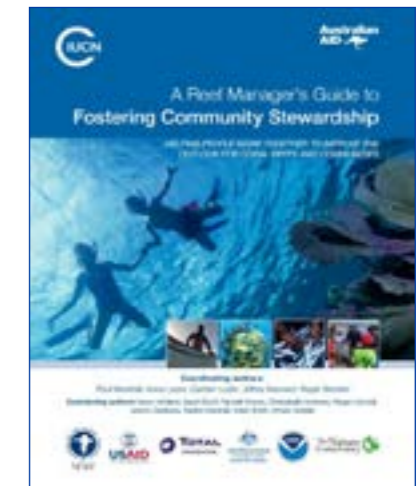


Explaining ocean warming: causes, scale, effects and consequences

This landmark publication is the most recent, most comprehensive and in-depth report published to date on ocean warming, the lesser known result of our excessive emissions of carbon dioxide into the atmosphere. Over 80 leading scientists from 12 countries explain why ocean warming should matter to everyone and details what has happened as a result of the ocean absorbing more than 93% of the enhanced heating from the greenhouse effect and other human activities since the 1970s. The report catalogues the widespread impacts already occurring to ocean ecosystems, species and even the deep remote ocean. It looks at the likely economic consequences and risks to human health and well-being. Finally, it sets out the likely nature and scale of changes yet to come and should serve as a major contribution to future thinking on this subject by the Intergovernmental Panel on Climate Change, as well as governments, agencies and experts around the world.

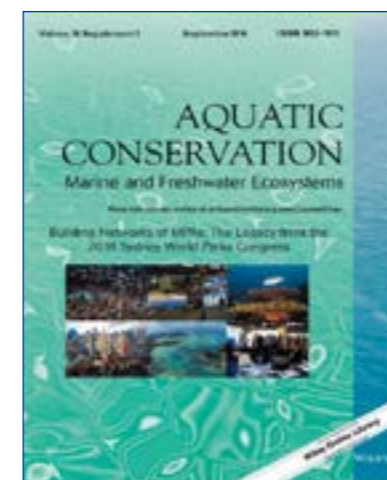
Reef Manager's Guide to Stewardship

After the success of the first edition "Reef Manager's Guide to Coral Bleaching", here is the next publication in the series: "A Reef Manager's Guide to Fostering Community Stewardship", a combination of both theoretical and practical guidance intended for coral reef managers to best use the power of community stewardship as main component of coral reef conservation and sustainable use programs. This publication draws from the experience of scientists running projects in Australia, Caribbean Pacific and Indian Ocean regions.



Special issue of Aquatic Conservation – Building Networks of MPAs: The Legacy from the 2014 Sydney World Parks Congress

This issue contains 15 papers covering many of the key issues discussed in Sydney, including connecting people to nature, MPA management and the challenges of protecting the high seas. The Special Issues were conceived to give people who might not otherwise publish peer-reviewed literature the opportunity to share their expertise and experiences with a much wider audience. This success of this initiative is clearly illustrated by the fact that ten of the top downloaded papers for Aquatic Conservation in 2015 were published in the first Special Issue series from the IMPAC3.





Atlas of the Mediterranean Seamounts and Seamount-like Structures

Seamounts are seafloor structures of different origins that feature in all of the world oceans and may be defined as hotspots of biodiversity, greatly enhancing the productivity of the offshore ecosystems and the distribution of pelagic top predators. This Atlas contains detailed maps, made with GIS software, geographical locations, depth data and other relevant information. It also summarises the results of research conducted in the field under the PROMETEOS project and provides a good starting point for further conservation work on seamounts.

African Solutions in a Rapidly Changing World:

Nature-based solutions to climate by African innovators in protected areas

As the world grapples with the urgency of addressing the evident and predicted impacts of climate change, there are many communities whose lives and livelihoods are being affected on a daily basis. In Africa, characterised by its exceptional biological richness and high natural resource dependency, the outlook is particularly concerning. The IPCC findings not only identify this region as one where the rate of climate change is faster than predicted, but also as one of the most vulnerable, due to its limited adaptive capacity.



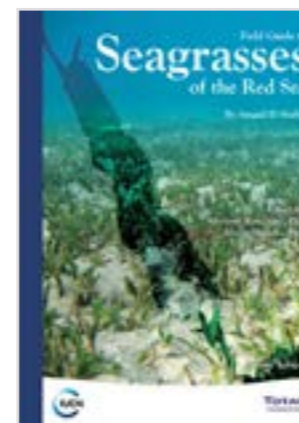
The Sustainability of Fish Feed in Aquaculture

Thoughts and recommendations on technological, economic, social and environmental aspects

Within its series of reports about the sustainable development of aquaculture, IUCN presents a report on the sustainability of fish feed. Describing all the proteins and lipids sources that are used and the feed manufacturing processes applied, it assesses the sustainability of the sources from all perspectives: environmental, societal and economic. The conclusions and recommendations are the results of several workshops and consultations. Whilst the work has carried out in French, major parts of the report have been translated into English.

Field Guide to Seagrasses of the Red Sea

Seagrass populations are declining globally at an alarming rate as a result of habitat destruction and marine pollution. The role of taxonomy in understanding and managing marine ecosystems is pivotal. Taxonomy provides basic and fundamental understanding of biodiversity and its functioning, maintenance and sustainable use. Without this understanding, it is very difficult to conserve species through targeted management intervention. This Guide is a fundamental step forward in understanding and managing seagrass species and habitats as an easy-to-use yet comprehensive field guide to the seagrasses of the Red Sea.



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IUCN World Conservation Congress - Hawai'i 2016

Held once every four years, the IUCN World Conservation Congress looks to bring together change-makers from across the world, representing the brightest minds in academia, government, business, indigenous peoples and civil society to find innovative solutions for our planet. The IUCN World Conservation Congress therefore provides a unique and well-timed opportunity to add to the historic agreement at the UNFCCC COP Paris and will serve to mobilise action.

The theme of this year's Congress is "Planet at the crossroads", highlighting the necessity for urgent

change and the importance of making the right decisions now that will affect our planet and future generations. Instead of succumbing to a pessimist narrative, IUCN chooses instead to insist that we are ready and able to take on this important challenge and make great change together.

We are very lucky to have inspiring marine conservation heroes in attendance, including the author of this year's editorial, Sylvia Earle, an IUCN Patron of Nature and the founder of Mission Blue. Her presence, among other amazing attendees at this year's Congress, will create an atmosphere of excitement

and possibility that will set the scene for successful decision-making.

If you'll be in beautiful Hawai'i, please join us at our Oceans & Islands Pavilion, which will be organised around three key themes: Marine Protected Area Networks, Islands & Overseas Territories and Financing & Blue Economy. We will explore the issues facing our oceans, islands and our poles today and provide a space where interested individuals and professionals can mingle and discuss solutions for the future.

Ocean and Island events in numbers



Hawaii at a Glance...

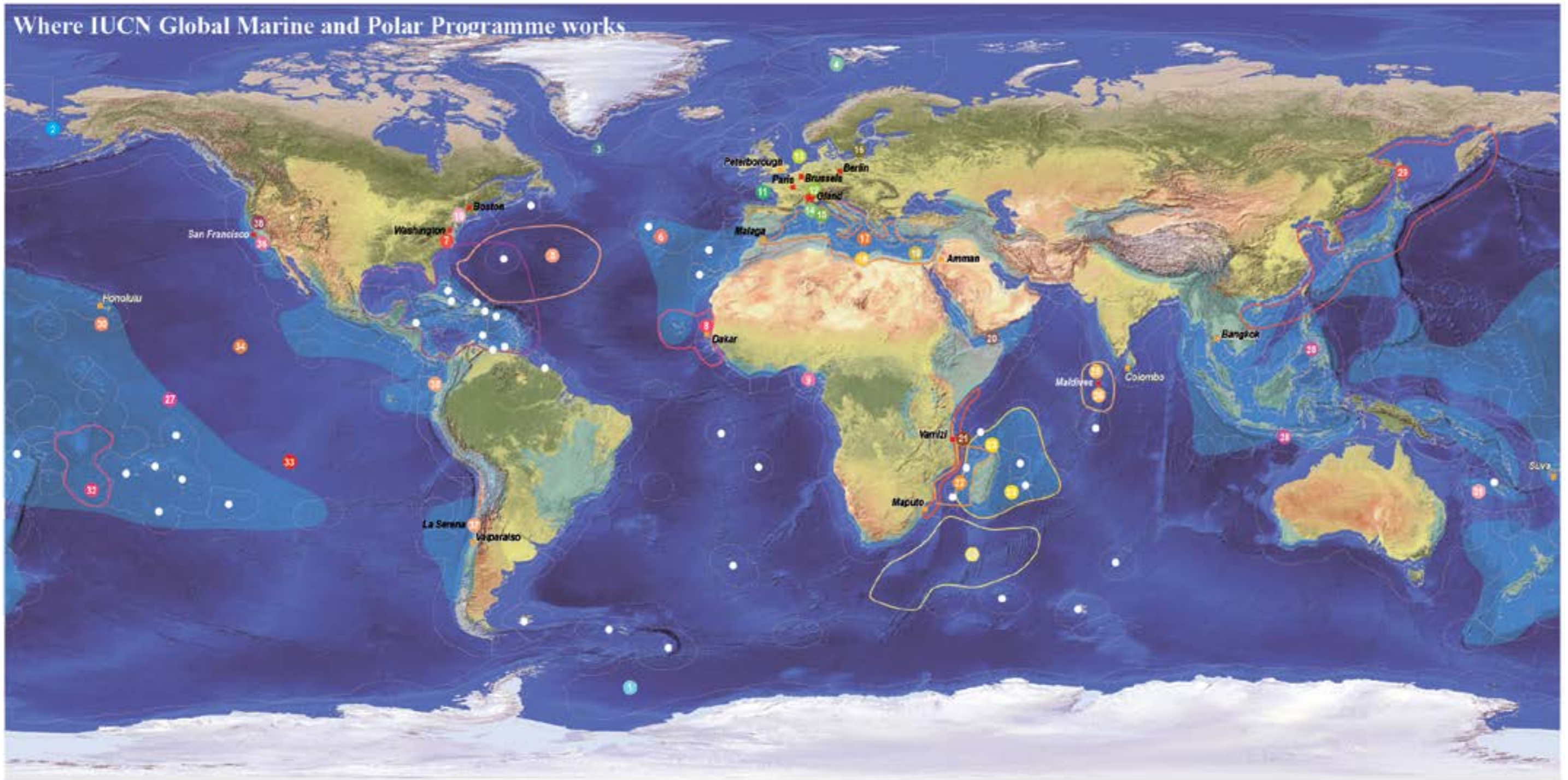


Images:
Background: Ameer Abdullah
Hawaii Images: Sebastia Semene Guitart
Kelp: Ron McPeak



IUCN
World Conservation Congress
Hawai'i 2016

Where IUCN Global Marine and Polar Programme works



Global Marine and Polar Programme

OFFICES & COLLABORATORS

- ★ Headquarters - Switzerland
- GMPP Offices
- GMPP Collaborators

Valparaiso: *Patricio Bernal*
 Peterborough: *Dan Laffoley*
 Dakar: *Idriss Deffries*
 Malaga: *Alain Jedy de Grissac*
 Amman: *Ziad Samaha*
 Maputo: *Mannel Menemussanga*
 Colombo: *Arjan Rayasuriya*
 Bangkok: *Maeve Nightingale*
 Suva: *Leanne Fernandes*

- EEZ (Marineregions)
- Marine Biodiversity Hotspots (CI)
- Land Biodiversity Hotspots (CI)

MAJOR PROJECTS

- BEST Initiative - Biodiversity and Ecosystem Services in Territories of European Overseas

Polar regions

- 1 Network of Antarctic MPA
- 2 Maritime Safety for Bering Strait Small Vessels Pilot Program
- 3 Arctic Plastic Projects
- 4 Ocean Acidification in Arctic Fjords

Caribbean & Atlantic

- 5 Sargasso Sea Commission
- 6 Microplastics Initiative
- 7 SEVENSEAS Magazine
- 8 Marine Protected Area & Fisheries
- 9 Niger Delta Panel
- 10 Law of the Sea Implementing Agreements, NY

Europe, Mediterranean & Red Sea

- 11 Sustainable Aquaculture Fish Feed
- 12 Blue Action Fund - Frankfurt
- 13 North Sea Industry Engagement

- 14 Ocean Acidification RUG - Monaco
- 15 Marine Protected Areas & Aquaculture - Monaco
- 16 Ocean Warming
- 17 MPA Networks & Integrated Coastal Zones Management
- 18 Marine Monitoring & Indicators - Country legislation review and administration - North Africa
- 19 MPAs Strategies, Networks Development and Fisheries - Eastern Mediterranean

Indian Ocean

- 20 Yemen LNG Scientific Advisory Panel
- 21 Marine Research & Conservation Center - Vanizi
- 22 Marine Spatial Planning - Mozambique Channel
- 23 Connectivity of Loggerhead turtles - Mayotte Island
- 24 South-Western Indian Ocean Deep Sea Ecosystems - Walters Shoal
- 25 Whale Sharks and Manta Rays - Maldives
- 26 Coral Reefs & Climate Change (REGENERATE) - Maldives

Pacific

- 27 Plastic hotspot mapping Report
- 28 Blue Solutions - Philippines & Bali
- 29 Western Gray Whale Range-wide Conservation Initiative
- 30 World Conservation Congress - Hawaii
- 31 South Pacific Regional MPA Network
- 32 Cook Islands Marine Park
- 33 Open Ocean Carbon
- 34 Deep Sea Mining
- 35 GEF Blue Forests
- 36 LME Google Layer & Toolkit
- 37 IMPACT - Chile
- 38 HopeSpot Council - San Francisco



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