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# Minimizing Vessel Strikes to Endangered Whales: A Crash Course in Conservation Science and Policy

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Smithsonian  
*National Museum of Natural History*

## **BEYOND THE OBITUARIES: SUCCESS STORIES IN OCEAN CONSERVATION**

Wednesday, May 20<sup>th</sup>, 2009

Smithsonian's National Museum of  
Natural History

### Agenda

<b>8:00 a.m.</b>	<b>Doors Open for Seating in Baird Auditorium</b>
<b>8:30 – 8:35</b>	<b>Welcome from the Organizers</b> Dr. Nancy Knowlton, Sant Chair for Marine Sciences, National Museum of Natural History Dr. Jeremy Jackson, Director, Scripps Center for Marine Biodiversity and Conservation
<b>8:35 – 10:00</b>	<b>Session 1: Restoration – Reviving Ocean Ecosystems</b>
<b>10:05 – 10:40</b>	<b>Session 2: Fisheries – Protecting Stocks from Coasts to the High Seas</b>
10:40 – 11:00	<i>Break</i>
<b>11:00 – 12:00</b>	<b>Session 3: Whales and Turtles – Ocean Giants on the Rebound</b>
<b>12:00 – 2:00</b>	<b>Poster Session in the Executive Conference Room</b> More than twenty marine scientists and professionals will gather to display posters and discuss a broad spectrum of exciting ocean conservation successes they have worked on.
<b>12:00 - 2:00</b>	<b>Book Signing: Deborah Cramer, <i>Smithsonian Ocean: Our Water, Our World</i></b>
<b>2:00 – 3:25</b>	<b>Session 4: Coral Reefs and Reef Fisheries – Saving the Rainforests of the Sea</b>
3:25 – 3:45	<i>Break</i>
<b>3:45 – 5:00</b>	<b>Session 5: Marine Protected Areas – Safe Harbors for Ocean Treasures</b>
<b>5:00 – 5:05</b>	<b>Closing Remarks</b>

## **Session 1: Restoration – Reviving Ocean Ecosystems**

Session Chair: Denise Breitburg, Smithsonian Environmental Research Center

### **Mangrove Restoration: Hope for the World's Tropical Coasts?**

Presenter: Ilka C. Feller, Smithsonian Environmental Research Center

Mangroves are trees and shrubs that form the forested wetlands on many of the world's tropical coasts. Mangrove forests provide essential and diverse habitats for rich communities of plants and animals and critical ecosystem services for society. They function as nurseries for many marine species, stabilize and protect shorelines, and filter sediments and nutrients from upland runoff. Yet, mangroves are one of the world's most threatened ecosystems. More than 50% of the world's mangrove forests have been lost in the past 50 years, largely due to shrimp-farm aquaculture, agriculture, mining, and coastal development. The current rate of destruction is projected to continue over the next two decades, leaving less than 15% of the world's mangrove forests intact by 2025. Despite this bleak outlook, there are glimmers of hope. Some governments and local communities have recognized that mangrove forests can protect life and property during hurricanes, typhoons, and tsunamis; allow coastal areas to keep pace with rising sea levels; and replenish fisheries. In Vietnam and Indonesia, mangroves are being replanted to protect communities from storm and wave damage and improve fisheries and livelihoods. In the Philippines, mangroves are being replanted in areas previously cleared for shrimp farms. And in Belize and Panama, local NGOs and citizens are protesting the destruction of mangroves.

### **Seagrass Recovery in the Virginia Coastal Lagoons: The Grass is Greener on the Seaside!**

Presenter: Robert J. Orth, Virginia Institute of Marine Science

Seagrasses, true flowering plants that live completely underwater in shallow coastal areas, are disappearing from around the world due to a variety of human impacts. Eelgrass, a species abundant along the east coast of North America from North Carolina to Canada, was once abundant in the Virginia coastal lagoons but was completely lost in the 1930's due to a pandemic disease and hurricane. However, since 1997 over 23 million eelgrass seeds have been broadcast into 208 acres. Growth and natural seed spread from these planted acres have produced 2430 acres of eelgrass by 2008. These rapidly expanding eelgrass meadows in the coastal lagoons contrast with the adjoining Chesapeake Bay, where eelgrass has been steadily declining and where most restoration projects have not been successful. Indeed the grass is greener on the seaside!

## **Restoring Conch to the Conch Republic: It's All About Location, Location, Location**

Presenter: Robert Glazer, Florida Fish and Wildlife Conservation Commission; Fish and Wildlife Research Institute

The Florida Keys (aka The Conch Republic) once had a thriving queen conch population that supported commercial and recreational fisheries. However, by the mid-1980's, the population had declined and all collection was prohibited. After the closure, the population did not recover on its own. Clearly, a proactive approach was necessary. Releasing hatchery-reared conch was evaluated and deemed unfeasible. Subsequently, one important fact emerged: a significant proportion of the conch population that once reproduced no longer developed gonads; all reproduction had shifted to the population furthest offshore. We began transplanting celibate conch into populations where reproduction was common, and within six months, they started reproducing. However, this alone was not enough. We needed to determine the optimal location to target our restoration efforts so that the planktonic offspring that were produced would provide the maximum benefit to the entire Keys. We used drift vial and plankton surveys and selected the lower Keys as the region most likely to be successful. Since the onset of our transplantation program, the recovery has been relatively steady. To date, we have augmented the conch population in this region by 15% and the population has increased from approximately 10,600 in 1999 to approximately 22,000 in 2007.

## **Restoring the Charismatic Oyster: Welcome Oyster Mats Revive Dead Margins**

Presenter: Anne P. Birch, The Nature Conservancy – Florida Chapter

The eastern oyster, *Crassostrea virginica*, has long been prized for its economic value. But just as important are the "ecological services" provided by oysters and the reefs they form, including water filtration, food and refuge for other species, and shoreline stabilization. Given its importance to our economy and well being we might expect reverence for the humble oyster. Yet the recent study *Shellfish Reefs at Risk* reveals that oyster reefs are perhaps the most imperiled marine habitat with a startling 85% loss globally. In Florida, oyster reefs in the Mosquito Lagoon continue to decline from exposure to increasing boat wake frequency and intensity. The wakes dislodge oysters, and once tossed ashore they die, leaving just shell piles called "dead margins." The good news is that restoration of these damaged reefs is feasible. NOAA, The Nature Conservancy's Florida Chapter, and the University of Central Florida have joined forces to restore the lagoon's oyster reef habitat. The formula is simple and effective "scientific research + funding + partners + an army of volunteers = success." An "oyster mat" is created by attaching oyster shells to a 16.5 inch square mesh material. Hundreds of mats are then linked together and placed in strategic locations in the lagoon. Oyster larvae settle on the shell mats, and within 18-24 months can grow into a living oyster reef. Volunteers from all walks of life – more than 10,000 – help with every step of this project, confirming that the modest grey oyster is truly a charismatic species!

Further Reference: [www.nature.org/oysters](http://www.nature.org/oysters)

## **Making Great South Bay Great Again: Uniting Clams and People to Restore an Estuary**

Presenter: Carl LoBue, The Nature Conservancy on Long Island

Hard clams in Great South Bay once supported thousands of harvesters, many businesses, and over half the clams eaten in the US. Clams provided food and habitat for many species, and were so abundant that they could filter the entire volume of the bay in less than 3 days. Unfortunately, harvest rates were unsustainable, and the population has declined by greater than 90%. The loss of clams has impacted both people and wildlife, and has made the bay more susceptible to ecosystem altering algal blooms. The acquisition of 13,400 acres of submerged lands in central Great South Bay by The Nature Conservancy (TNC) recently set the stage for a long-term, large-scale restoration experiment, which has already produced remarkable results. In partnership with local, state, and federal managers, stakeholders, and scientists, TNC has been rebuilding the hard clam reproductive potential on their bay bottom since 2004. As of September 2008, over 320 million juvenile clams have settled over thousands of acres of TNC-owned and adjacent public submerged lands. Early success has rejuvenated hope of a long-term recovery, prompting managers and stakeholders to take proactive measures so that future harvest is sustainable and the population is managed for high abundance.

Further Reference: [www.nature.org/longisland](http://www.nature.org/longisland)

## **From Species to Ecosystem Recovery: Ridding Alaskan Islands of Exotic Predators**

Presenter: James A. Estes, University of California, Santa Cruz

Arctic foxes were introduced to more than 400 Alaskan Islands in an effort to maintain the Pacific maritime fur trade. These predators had devastating effects on ground nesting birds, including Aleutian cackling geese and numerous seabird species. The recovery of geese from near extinction required the development of methods to rid the islands of foxes and to reintroduce the geese. As a result of this more than 30 year trial and error effort, goose populations are now thriving. The recovery of other species of burrowing and ground-nesting seabirds has further restored the delivery of nutrients from the nutrient rich ocean to the nutrient poor land, in turn transforming the terrestrial ecosystems from unproductive maritime tundra (an altered state) to grasslands (the presumed natural state). This is an interesting case study in conservation biology because it demonstrates how management activities on land can influence marine species and complex ecological linkages between the sea and the land.

## **From Black to Blue: Reversing Declines in the Health of the Black Sea**

Presenter: Marea E. Hatziolos, The World Bank Group

The ancient Greeks called the Black Sea as “The Inhospitable Sea” (Axenos Pontis) because of the stormy, dark waters and barbarian settlements along its rim. The name Black Sea is thought to derive from the deep green of its nutrient-laden waters, enriched by the effluent of three major rivers – the Danube, the Don, and the Dnieper – which together drain nearly 1/3 of Europe. Frequent algal blooms fertilized by run-off, a deep sea basin, and a limited exchange of seawater with the Mediterranean have contributed to the formation of a huge Dead Zone extending from 200m below the surface to the bottom of the Black Sea (2,000 m). In the 1970s and ‘80s, the Dead Zone extended upward, due to increased use of fertilizers and agricultural run-off, and large discharges of untreated waste-water. Fish stocks in the upper reaches of the Black Sea collapsed from hypoxia, and recruitment was limited by the invasion of an alien comb jelly. Annual declines in tourism from poor bathing water quality added to the economic loss. This case study documents the turn-around achieved through investments by the riparian countries, the World Bank and the Global Environment Facility in nutrient reduction measures, and the political and economic incentives that made reversing these downward trends possible.

## **Session 2: Fisheries – Protecting Stocks from Coasts to the High Seas**

Session Chair: John Hocevar, Greenpeace USA

### **The Fight to Save the Atlantic Striped Bass**

Presenter: Dick Russell, author of *Striper Wars: An American Fish Story*

By the early 1980s, the venerable fish that enabled the Pilgrims to survive their first winters was in danger of disappearing from the Eastern seaboard. A combination of pollution and overfishing were identified as the probable cause, and a grassroots recreational fishermen’s campaign began calling for much stricter regulations all across the coast. Over the course of several years, this resulted in a moratorium on keeping striped bass in a number of states - and, eventually, a comeback that Scientific American hailed as “probably the best example in the world of a species that was allowed to recoup through tough management and an intelligent rebuilding plan.”

Further Reference: <http://www.dickrussell.org/striper.htm>

### **No More Bare Bottoms: Halting the Advance of Bottom Trawling**

Presenter: Michael Hirshfield, Oceana

Scientists and conservationists have called for restrictions if not outright bans on bottom trawling for years because they are so destructive to seafloor life. Following new information about the extent and vulnerability of communities such as deep sea corals, much of the effort has focused on preventing the expansion of bottom trawling into new areas, dubbed “freezing the footprint.” Efforts to restrict bottom trawling in Federal waters of the United States have met significant success. Over one million square miles of seafloor have been closed to bottom trawling in the past five years, primarily off the states of California, Oregon, Washington, and Alaska. Most recently, a precautionary closure was recommended for nearly 200,000 square miles of Arctic waters. Progress is also being made on the East Coast of the US, although more slowly, as well as in other parts of the world.

### **Defending the High Seas**

Presenter: John Hocevar, Greenpeace USA

With the advent of modern technology and the decline of nearshore fish stocks, fisheries have expanded to deeper and more remote areas, leaving many species with no place to hide. Conservation of high seas areas has lagged well behind the expansion of fisheries into international waters, but much important progress has been made. This presentation will focus on two examples. In 2007, the UN passed a resolution to address bottom trawling, leading to new efforts to protect vulnerable seafloor habitats. And in 2008, eight island nations in the western central Pacific moved to protect high seas areas surrounded by their territories, creating what may become the first marine reserves in international waters.

Further Reference: [www.greenpeace.org/international/campaigns/oceans/marine-reserves/pacific-tuna-need-marine-reserves](http://www.greenpeace.org/international/campaigns/oceans/marine-reserves/pacific-tuna-need-marine-reserves)

## **Session 3: Whales and Turtles – Ocean Giants on the Rebound**

Session Chair: Larry Crowder, Duke University

### **Finding New Zealand's 'Lost Whales': The Decline and Remarkable Survival of a Subantarctic Stock of Right Whales**

Presenter: C. Scott Baker, Oregon State University

Southern right whales (*Eubalaena australis*) around New Zealand were among the most intensively exploited populations of whales in the world, starting with the arrival of European whaling vessels in the early 19<sup>th</sup> century. As a consequence, right whales simply vanished from the mainland coast of New Zealand for most of the 20<sup>th</sup> century and remain extremely rare today. Unknown to the world, however, a remnant population of right whales survived around the subantarctic Auckland Islands. Unfortunately, this population was first discovered by Soviet whaling vessels engaged in illegal hunting during the early 1960's, once again bringing this population to the edge of extinction. We initiated the first expedition to assess the recovery of these 'lost whales' in the winter of 1995, using photo-identification to estimate current abundance at about 1,000 individuals and genetic samples to measure the loss of diversity due to the intensive 'exploitation bottleneck.' We also reviewed historical whaling records to reconstruct the history of decline and estimated that, prior to exploitation, right whales numbered approximately 42,000 in the western South Pacific. Our historical reconstruction confirms that the population came perilously close to extinction (with as few as 25 mature females surviving in the early 20<sup>th</sup> century) and suggests that the former abundance and ecological role of these whales in the subantarctic marine ecosystem were considerably greater than generally assumed.

Further Reference: <http://mmi.oregonstate.edu/ccgl>

### **Minimizing Vessel Strikes to Endangered Whales: A Crash Course in Conservation Science and Policy**

Presenters: Moira W. Brown, New England Aquarium; Canadian Whale Institute and David Wiley, Stellwagen Bank National Marine Sanctuary, NOAA's National Ocean Service

The North Atlantic right whale is one of the most endangered of all large whales: about 350-400 individuals remain. Species recovery is, in part, contingent on reducing vessel-strike mortality. Our science-based conservation program resulted in three efforts specifically designed to minimize the risk of lethal vessel-strikes of endangered baleen whales without compromising vessel navigation and safety. In Atlantic Canada, the Bay of Fundy Traffic Separation Scheme (TSS) was relocated to reduce the risk of lethal vessel strikes by 90% where the original outbound lane of the TSS intersected the Right Whale Conservation Area, and an Area To Be Avoided (ATBA) adopted for Roseway Basin has demonstrated an 82% reduction in the risk of lethal vessel-strikes. In the Gulf of Maine, the Boston TSS through the Stellwagen Bank National Marine Sanctuary was relocated to reduce the overlap between vessels and endangered baleen whales by ~81% and by ~58% for right whales alone. This rerouting of vessels for whale conservation, as sanctioned by the International Maritime Organization, sets a precedent for national and international marine conservation policy by providing vessels with direct actions they can take to protect endangered whales – both regulated (TSS) and voluntary (ATBA). This demonstrates that despite contentious conditions, effective science-driven policy tools for conservation can be identified, made available, and implemented. The science also provides the quantitative means to measure policy efficacy through monitoring of vessel compliance and, in some cases, can increase compliance through improved real-time communications regarding whale locations in high-risk areas.

Further Reference: [www.rightwhale.ca/](http://www.rightwhale.ca/) and [www.listenforwhales.org](http://www.listenforwhales.org)

## **Anatomy of a Conservation Success Story: Lessons Learned from a Half-Century of Sea Turtle Protection at Tortuguero, Costa Rica**

Presenter: David Godfrey, Caribbean Conservation Corporation

The Caribbean Conservation Corporation (CCC) celebrates its 50<sup>th</sup> anniversary this year—marking a half century of sea turtle research and conservation. The organization began its efforts in 1959 by launching the world's first, sustained sea turtle conservation initiative at Tortuguero, Costa Rica, site of the largest remaining green turtle rookery in the Western Hemisphere. At that time, the nesting population was under great threat from over-harvesting and was on a fast-track toward extinction. CCC's sea turtle research and protection project at Tortuguero is now the longest-continuous program of its kind. Achievements during these 50 years of work include: a nearly 500% increase in green turtle nesting since 1970; permanent protection of the nesting beach through the establishment of Tortuguero National Park; strong support for sea turtle conservation by Tortuguero residents; an annual research assistant-ship program to train leaders in marine conservation; comprehensive laws protecting sea turtles and their eggs from harvest in Costa Rica; and the development of a lucrative, sustainable ecotourism industry, which replaced consumptive use of sea turtles. The scientific, legal, economic and social strategies employed by CCC at Tortuguero offer important lessons for any long-term conservation project.

Further Reference: [www.cccturtle.org](http://www.cccturtle.org)

### **The Decline and Recovery of the Kemp's Ridley Sea Turtle**

Presenter: Larry B. Crowder, Duke University

Once considered the most endangered sea turtle species, Kemp's ridley sea turtles have experienced a turn around. The nesting beach for Kemp's ridley at Rancho Nuevo, Mexico wasn't identified until the early 1960s and the first surveys there documented only about 6000 nests. Over the next 20 years, despite heroic efforts to recover this population further declines led to only 800 nests (fewer than 300 nesting females). An international collaboration persisted to recover this population from its nadir in 1988. Over the past 20 years, the population has increased about 12% per year and is on trajectory to its recovery goal. This presentation will share some of the stories about individuals and institutions that made this success possible.

## **Session 4: Coral Reefs and Reef Fisheries – Saving the Rainforests of the Seas**

Session Chair: Jeremy Jackson, Scripps

### **Coral Reef Resilience to Warming: The Chagos Archipelago, Indian Ocean**

Presenter: Charles Sheppard, University of Warwick

Reefs of the Chagos Archipelago in the central Indian Ocean were badly affected by warming in 1998, and they suffered severe but mostly non-lethal bleaching at least twice subsequently. But the archipelago has been largely uninhabited for 30 years, so most of it does not suffer from sewage, industrial pollution, sedimentation or overfishing. Recovery of the corals has been extremely good, such that after 10 years most shallow reef areas have recovered fully in terms of coral cover (though not yet in terms of structural complexity). Deeper reefs are recovering more slowly, but recovery continues. It has been concluded from several studies there that reefs which suffer from climate change effects but which do not suffer from 'local' or direct human impacts, show a much greater ability to bounce back from warming mortality. Good local management on inhabited reefs is, therefore more, not less, important in the face of climate change.

### **What do Condoms have to do with Marine Conservation?**

Presenter: Leona D'Agnes, PATH Foundation Philippines Inc.

This session examines a community development model that integrates marine resource conservation, human livelihoods, and family planning. A six-year study of the Philippines Integrated Population and Coastal Resource Management (IPOPCORM) approach shows that it was not only more successful in conserving marine resources than a stand alone marine protected area (MPA) project, but it was also more effective for the human populations involved. In addition to restoring coastal ecosystems, IPOPCORM also resulted in higher rates of contraceptive use, better family budget management and fewer people with incomes below poverty. The approach is now successfully functioning in over 1,000 coastal hamlets and PATH Foundation Philippines recently exported the technique to Nepal (substituting forestry for marine resources) with other countries planned for the near future.

Further Reference: [www.pfpi.org/PDF/ECSP\\_Focus\\_Apr08Castro.pdf](http://www.pfpi.org/PDF/ECSP_Focus_Apr08Castro.pdf)

### **Pot Caught Crab**

Presenter: Alfonso F. Gamboa, Saravia Blue Crab, Inc.

For fishermen engaged in blue crab fishing, Saravia Blue Crab provides the opportunity to adopt a sustainable fishing method that preserves the breeding stock and uses biodegradable materials; increase income levels up to 400% through higher quality and consistency of catch; create a second source of income for the fishing family by processing fresh catch into picked meat; create an additional market for bamboo; provide a source of livelihood, particularly for women, who weave the pots; and engage in value added processing by pasteurizing fresh crab meat for export to the U.S. market. The sustainable fishing method employed is a unique selling point in itself, which can command a premium in the U.S. market. The present fishing method of using gill nets is erratic and susceptible to problems both natural (like rough weather) and man-made (like sea traffic). Without a consistent catch, there is no opportunity to embark on value added processing as supply would be a constant problem threatening the viability of investing in pasteurizing plants.

## **Ten by 2010: A Fisheries Management Initiative in Danajon Bank, Philippines**

Presenter: Nygiel Armada, FISH Project, Tetra Tech E.M. Inc.

The Danajon Bank off northern Bohol, central Philippines is a double barrier reef ecosystem consisting of three large reefs spread across 130 kilometers, many clusters of small reefs, and about 40 small islands. Its extensive coral, mangrove and seagrass habitats support an array of sustenance fishing activities. During the last four decades Danajon Bank has been subjected to extremely high fishing pressure and destructive methods like use of dynamite, cyanide, trawl, Danish seine and fine meshed nets. Fisheries management interventions have been initiated through a USAID funded Fisheries Improved for Sustainable Harvest (FISH) Project. The project was designed to intervene in fisheries management through capacity building, constituency building, and policy improvement and is expected to increase fish stocks 10% by 2010 over the 2004 baseline. The initiative intends to change exploitation pattern among resource users by establishing controls, such as a network of MPAs, species-specific management, gear restrictions and size limits, registration and licensing, zoning of fishing and water activities, and cross-cutting activities in IEC, policy improvement, and fisheries law enforcement. The initiative generated baseline data in 2004 and subsequent monitoring is being conducted every two years until 2010. So far, the baseline fisheries survey and the 2006 and 2008 monitoring events indicate increases in fish stock (aggregate weighted average of 23% increase for gears used in the survey). And MPA monitoring has shown increases in species richness and live hard coral cover.

Further Reference: [www.oneocean.org](http://www.oneocean.org)

### **Effects of the 1990 Fish Pot Ban on Bermuda's Herbivore and Piscivore Fish Stocks**

Presenter: Sheila McKenna and Thaddeus Murdoch, BREAM, Bermuda Zoological Society

Located in the North Atlantic at 32°20'N and 64°50'W, Bermuda supports the northern-most coral reef system in the world. The islands of Bermuda have a land mass of just 55 square km and are surrounded by a total reef platform area of approximately 1,000 square km. The majority of marine species represented are derived from the Caribbean – a direct result of transport by the Gulf Stream. However, in comparison to the Caribbean, Bermuda's reefs have not suffered dramatic declines in coral cover in the past three decades. This better reef health can be attributed in part to "natural" causes, including an absence of temperature sensitive and disease ravaged acroporids. However, as we will demonstrate with ecological time-series data on coral cover and fish stocks, there is ample proof that local management practices, including protecting all hard and soft coral since the 1970s, all parrotfish since 1991, and managing all fish in a very conservative manner, have contributed greatly to the present healthy condition of our marine environment. Carefully planned, scientifically-based and ecosystem-level legislative actions in Bermuda have played out in the real world and show cause for optimism.



## **Grouper Moon: Conserving an Endangered Reef Fish in the Cayman Islands**

Presenter: Brice Semmens, NOAA's Northwest Fisheries Science Center

Five years ago, the Cayman Islands government protected all known Nassau grouper spawning sites in the Cayman Islands in response to what they identified as a critical conservation need. This move was motivated by the 2001 discovery and rapid depletion of a large (~7000 fish) spawning aggregation on the west end of Little Cayman Island. The government's quick legislative response, motivated by the results of a potent collaboration between a government agency and an environmental non-profit, protected the last functional Nassau grouper aggregation left in the Cayman Islands before all the fish were taken. The west-end site is now home to one of the largest fully-protected spawning aggregations of this endangered and economically important reef fish.

## **Customary Management, Property Rights, and Economic Development in Artisanal Reef Fisheries**

Presenter: Joshua Cinner, ACR Centre of Excellence for Coral Reef Studies at James Cook University

The ecosystem goods and services provided by coral reefs are critical to the social and economic welfare of hundreds of millions of people. Despite the often grim news about widespread reef degradation, there are a number of success stories from around the globe about local communities tackling the coral reef crisis. This presentation will review successes in creating community closures, managing fishing gears, and developing property rights and describe recent breakthroughs that address important linkages between social and ecological systems.

Further Reference: <http://www.seaweb.org/oceanvoices.php>

## **Session 5: Marine Protected Areas – Safe harbors for Ocean Treasures**

Session Chair: Jon Day, GBRMPA

### **Park Protects Profits, Predators, Parrotfishes, and Pivotal Processes**

Presenter: Daniel R. Brumbaugh, Center for Biodiversity and Conservation, American Museum of Natural History

The Exuma Cays Land and Sea Park (ECLSP) - including 456 square km (176 square mile) made up of shallow seagrass beds, coral reefs, other hard and soft bottom habitats, a drop-off into the deep, semi-enclosed basin of Exuma Sound, and an archipelago of small rocky islands - was established as The Bahamas' first national park in 1958. Approximately three decades later, its marine waters became an enforced no-take marine reserve, one of the earliest and largest in the Caribbean. Much research has documented the effects of the reserve on key fisheries species, including spiny lobsters, queen conch, and groupers. In addition, several community-wide effects on reefs, associated with enhanced grazing by parrotfishes, have also been documented in the park recently. Consequently, the ECLSP provides a dramatic, well-studied example of a marine reserve that provides both valuable fisheries benefits and important ecosystem functions that together, enhance the social and ecological sustainability of this region of The Bahamas. In doing so, it provides a potential model for what can be achieved with this management tool, especially in combination with other fishing and natural resource measures, to help restore degraded Caribbean reef ecosystems.

Further Reference: <http://bbp.amnh.org/>

### **Seabird Mania: How More People Can Also Equal More Seabirds!**

Presenter: Roy W. Lowe, Oregon Coast National Wildlife Refuge Complex

Human disturbance in close proximity to seabird breeding colonies can result in serious impacts to these sensitive bird species and can result in reduced reproduction, colony abandonment or prevention of colony establishment. At Yaquina Head, a small coastal headland along the Oregon coast, the U.S. Fish and Wildlife Service and the U.S. Bureau of Land Management have worked cooperatively for nearly three decades to protect nesting seabirds while providing compatible public use of the area. From 1979 to the present, public use of this small headland increased 200-300%. However, through interpretation, environmental education, and elimination of public access to key sites, seabird populations have also grown dramatically. The Brandt's cormorant breeding population at Yaquina Head increased 2,160% while the common murre breeding population increased 1,600%. The success at Yaquina Head clearly demonstrates that with appropriate management and public education, high density human use can occur in close proximity to sensitive marine resources, such as nesting seabirds, without adversely affecting their populations.

## **Community-Based Management of an MPA Network in Hawai'i**

Presenter: Brian N. Tissot, Washington State University Vancouver

For the last 10 years we have been involved in the conservation of live-caught aquarium fish along the western shore of the Island of Hawai'i using community-based management of a network of MPAs. Our collaborative conservation program, which involves multiple agencies, including state resource agencies, university faculty and students, large and small NGOs, and a variety of local community groups, has successfully implemented and studied a network of MPAs designed to balance community interests, the coral reef dive tourism industry, and a sustainable aquarium fishery. After 7 years, areas within MPAs had five times the density of prime targeted sized fish (5-10 cm), and 48% higher density of adults, than open areas. The project is unique in that it has engaged a diverse group of stakeholders in co-management, education, and cooperative research using a variety of disciplinary approaches. In addition to successful replenishment of fishes within MPAs, the project has shown seeding via larval connectivity between local populations, evidence of adult spillover into fished areas, improvements in fishery productivity, increased community vigilance, improved perceptions regarding MPAs, and reduced conflict among stakeholders. Our project also involves extensive K-12 and college-level education and involvement in research, a volunteer coral reef monitoring program, community outreach, recruitment of underrepresented groups into University research, and national and international dissemination of scientific publications, public talks, and involvement in management- and policy-initiatives.

Further Reference: <http://coralreefnetwork.com/kona/default.htm>

## **Successful Start at Rebuilding Overfished Predator Populations and Responding to Climate Change in the Florida Keys National Marine Sanctuary**

Presenter: Billy D. Causey, Gulf of Mexico and Caribbean Region  
National Marine Sanctuary Program

The Florida Keys National Marine Sanctuary (FKNMS) is a 9,800 square-km marine protected area that includes the most extensive coral reef ecosystem in North America. The Sanctuary has a comprehensive management plan, implemented in 1997, that includes multiple-use marine zoning as a cornerstone of managing intense utilization of natural resources. More than five million people live immediately north of the Keys in South Florida, and the Florida Keys receive more than four million visitors annually. In addition to heavy recreational snorkeling, diving, and fishing there are active commercial fisheries for snapper and grouper, spiny lobsters, and stone crabs. Fishery statistics show that most commercially fished species in the snapper/grouper complex are overfished; it is estimated that most legal-sized spiny lobster are captured each season. In addition to overfishing, a major threat to coral reefs in the Florida Keys is climate change, particularly mass bleaching events that have increased in intensity over the past 25 years. This success story will highlight how fishery regulations and no-take marine zoning have resulted in rebounds in predator populations, pushing the system "in the right direction." It will also highlight the Florida Reef Resilience Program, which has mobilized large-scale, annual surveys of coral bleaching and condition in an effort to improve our understanding of resilience along the Florida Reef Tract.

Further Reference: [www.floridakeys.noaa.gov](http://www.floridakeys.noaa.gov)

## **Restoring the Biodiversity of the Great Barrier Reef**

Presenter: Jon Day, Great Barrier Reef Marine Park Authority

Australia's Great Barrier Reef is the largest coral reef ecosystem on earth and home to an amazing diversity of plants, animals and habitats. The entire area (344,400 square km) was declared a multiple-use Marine Park in 1975. Coral reefs comprise only 7% of the Marine Park which includes amazing biodiversity ranging from shallow inshore fringing reefs to deep oceanic waters over 250 km offshore. A range of management 'tools' are in place to protect the area; one of the more significant tools is a systematic zoning network across the entire area. This network came into effect on 1 July 2004, and was the result of a comprehensive planning and consultative process over five years. Representative examples of all 70 broad habitat types (or 'bioregions') identified across the entire area are now fully protected within no-take zones covering over 33 per cent of the Marine Park. Equally important are other zone types and management arrangements across the Marine Park that allow sustainable uses including most types of fishing. Together these zones and management approaches ensure effective protection of this enormous World Heritage-listed area. A wide range of positive environmental outcomes are already occurring following the increased protection of this globally-significant marine ecosystem.

Further Reference: [http://www.gbrmpa.gov.au/corp\\_site/management/representative\\_areas\\_program](http://www.gbrmpa.gov.au/corp_site/management/representative_areas_program)



## **POSTER SESSION**

### **1) Community Marine Turtle Conservation in Southwest Madagascar**

Presenters: Frances Humber and Alasdair Harris, Blue Ventures Conservation

In October 2006 Blue Ventures started its marine turtle research and conservation programme in the Andavadoaka region of southwest Madagascar. As part of this programme the community were asked to monitor their own turtle fishery and to report any turtle nests found within the region. In April 2008 the first two green turtle nests were reported and consequently protected. Both successfully hatched and as a result of this the local community chose to protect the nesting beach and ban fishers from staying there. In a move unprecedented in Madagascar the local marine protected area committee has decided to ban turtle fishing for commercial traders. This programme has demonstrated an extreme shift in community perceptions of their turtle fishery and the first example of community-led marine turtle conservation in Madagascar

Further Reference: <http://goto.blueventures.org/turtleconservation>

### **2) Grupo Tortuguero de las Californias: A Decade of Re-Turtling the Eastern Pacific**

Presenter: Hoyt Peckham and Aaron Esliman, Grupo Tortuguero de Las Californias A.C

Since its creation in 1999, the Grupo Tortuguero de Las Californias A.C., a community based network made up of local fishermen and community members, has developed and employed the Conservation Mosaic model to protect and recover the sea turtle populations of the Baja California peninsula. By combining the three major aspects of the Conservation Mosaic (generating knowledge, building a network and communicating strategically), fishermen, scientists, women's groups, youth, government agencies and others partner to create long-term solutions for sea turtle conservation. The most important results of this open network include the building of an enduring conservation constituency among coastal citizens and dramatic reductions in consumption and bycatch of sea turtles across the region.

Further Reference: <http://www.grupotortuguero.org>

### **3) Reducing Human Induced Local Stress Helps Corals Cope with Warming Waters**

Presenter: Jessica Carilli, Scripps Institution of Oceanography

This study focuses on the dominant reef-building corals in Mesoamerica, *Montastraea faveolata* or the "mountainous star coral." I investigated changes in coral growth over the past century to determine how human impacts have affected these corals. I found that on reefs exposed to fewer human induced stresses such as agricultural runoff, fishing, or nearby human inhabitation, the corals were more capable of resisting and recovering from bleaching. Bleaching is a condition in which corals lose their symbiotic algae due to unusually warm water temperatures, and is very stressful for corals because they lose their main source of food. The results from this study provide hope: management efforts to reduce local human impacts such as runoff and overfishing may indeed increase the ability of corals to withstand warming waters caused by climate change.

### **4) Reef Restoration at Laughing Bird Caye National Park, Belize: A Potential Adaptation Strategy for Climate Change**

Presenter: Lisa Carne, Independent Biologist/Consultant, Placencia Village, Belize

Laughing Bird Caye National Park was hit by two major hurricanes (Mitch 1998 and Iris 2001). This, combined with bleaching events and disease outbreaks led to a local extinction of the once dominant Elkhorn Coral (*Acropora palmata*). In 2006, 19 Elkhorn coral fragments were transferred from the Main Barrier Reef to Laughing Bird Caye. Over two years later these corals are thriving and fragmenting, producing more corals asexually. Elkhorn coral is one of the fastest growing corals and provides habitat for hundreds of marine species, including the commercially important Spiny Lobster. Caribbean-wide Elkhorn coral's abundance has been reduced by >98% in the last 30 years, directly related to climate change and was recently added to the IUCN's Redlist of Endangered Species. This methodology demonstrates an adaptive strategy to restore degraded reefs and can be expanded into natural 'nurseries' to propagate resilient coral genotypes for future restoration efforts in the advent of more hurricanes and/or ship groundings.

### **5) Back to the Future: Bridging Modern Science to Traditional Governance and Management Practices to Save Coral Reefs in the Pacific Islands**

Presenter: Robert Richmond, Kewalo Marine Laboratory, University of Hawaii at Manoa

Coral reefs worldwide are being degraded by human-induced disturbances, resulting in ecological, economic and cultural losses. Runoff and sedimentation are among the greatest threats to coastal reefs surrounding high islands and adjacent to continental landmasses. Scientific data exist that identify key stressors, synergisms, and outcomes at the coral reef ecosystem, community and population levels. These data demonstrate that marine protected areas alone may be insufficient for coral reef protection and that integrated watershed management practices are also needed. Gaps in the effectiveness of environmental policy, legislation and regulatory enforcement have resulted in the continued degradation of U.S reefs. Several Pacific Islands, with intact resource stewardship and traditional leadership systems, have been able to apply research findings to coral reef management policies relatively quickly. Three case histories in Micronesia provide insight on how biophysical data can be applied to manage human behaviors responsible for coral reef destruction, through the social sciences.

## 6) Coastal Communities Saving the Seas

Presenter: Anthony Charles, Saint Mary's University

Despite the vastness of the oceans, a single coastal community can, and does, make a difference in marine conservation. Indeed, with most of the challenges facing the world's oceans being found close to shore – land-based pollution, marine habitat damage, fishing pressure and the like – coastal communities are on the front lines. And indeed, it is always people – one by one, but even more so when in communities – who hold the solutions to environmental problems. So around the world, coastal communities are taking action to solve marine problems. Around the world, models of local success in ocean conservation are being initiated – often “under the radar,” maybe even unknown to big international agencies and national governments. Together, all these initiatives are making a difference, and inspiring more action on the coasts of the world. Indeed, we need to take care not to balance the money put into large top-down efforts with equal support for local-level community-based conservation, which is at least as effective in making a real difference to ocean environments. This presentation describes local community-based success stories, showing the inspiration that comes from community action, and draws useful lessons from these experiences. A key message is that while the world's seas are vast, ocean conservation can and is successful “one brick at a time”; real support from governments and international bodies can help multiply these success stories many times.

Further Reference: [www.coastalcura.ca](http://www.coastalcura.ca)

## 7) Komodo National Park: It's Getting Better

Presenter: Andrew Harvey, Komodo National Park

Komodo National Park, Indonesia was established in 1980 and lies at the heart of the Coral Triangle, a region renowned for its rich marine biodiversity. Despite overexploitation of many of Indonesia's marine resources and a growing population within the Park, multiple indicators of conservation success within Komodo National Park have remained stable or positive, and marine tourism operators report: “it's getting better.”

Further Reference: [www.gokomodo.org](http://www.gokomodo.org)

## 8) Privately Managed Sugud Islands Marine Conservation Area in Sabah Malaysia

Presenter: Chung Fung Chen/Achier, Reef Guardian

Sugud Islands Marine Conservation Area (SIMCA) located in Sulu Sea, off the north eastern coast of Sabah, a state in Malaysia Borneo. SIMCA was officially declared as conservation area in 2001 and in 2003 Reef Guardian was appointed as the management company in charge of SIMCA. Reef Guardian is a private and focus solely on managing SIMCA. Since establishment, 50% to 70% of operation costs have been covered by conservation fees that generated from ecotourism in SIMCA, with the remainder being subsidized by private investors and conservation grants. This unique framework has provided Reef Guardian with sufficient funds for carrying out conservation activities such as research, monitoring and enforcement activities. Reef Guardian has shown positive and measurable outcomes since 2003. The total number of sea turtle nesting increased from 101 nests in 2003 to 350 nests in 2008. Additionally, the mean abundance of commercially important groupers in SIMCA is significantly higher with 8.9 individuals per 250m<sup>2</sup>. Reef Guardian carrying out sea patrols to restrict illegal fishing within SIMCA and the use of dynamite and sodium cyanide for fishing. Between 2004 to July 2007, the average number of illegal fishing vessels stopped dropped from 3.7 to 0.9. The positive conservation outcomes have been achieved in SIMCA. This has been possible due to the private management approach and availability of sustainable financing through ecotourism activities.

Further Reference: [www.reef-guardian.org](http://www.reef-guardian.org)

## 9) Red Sea Spinner Dolphins Protected, Supported by Controlled Ecotourism

Presenter: Giuseppe Notarbartolo-di-Sciara, Tethys Research Institute

Spinner dolphins seeking shelter for resting in the tiny reef of Samadai, Southern Egypt, were subject to increasing disturbance from uncontrolled tourism until the local government decided in 2003 to bring the situation in check through the implementation of a precautionary management plan. Today Samadai is a protected area which assures at the same time the continued presence of the dolphins in a wide, no-entry core zone, and a respectful dolphin-watching activity which contributes substantive revenues to the government's coffers. Such revenues are partly reinvested in conservation activities benefiting the surrounding marine and coastal environment.

## 10) Social Marketing and Marine Conservation: Achieving Conservation Results through Behavior Change

Presenter: Khanh Nguyen, RARE

All across the Pacific, farmers, fishermen, community leaders and families struggle to meet basic needs in the face of dwindling natural resources. At the same time, conservationists lament the ineffectiveness of protected areas and the lack of community support for better legislation or resource management. One thing is clear: while conservation has long been science-driven, success will mean factoring people into the equation in a more meaningful way. Where are the labs and instruments and case studies on changing behaviors, building public will, improving community relations, and launching environmental movements? Rare and its partners in 52 countries have been testing and refining an array of new tools to fill these needs. These tools make up what Rare calls a “Pride” campaign—so named because it inspires people to take pride in the species and habitats that make their communities unique, while giving them real alternatives and incentives to change behaviors. Running for approximately 2 years at any given site, Pride campaigns incorporate everything from social marketing to public relations; government affairs to community development; and education to entertainment. Rare trains local organizations in proven community engagement techniques and then relies on them to add an essential understanding of local culture and social norms — as well as to sustain impact long term.

Further Reference: [www.rareconservation.org/apply](http://www.rareconservation.org/apply)

## 11) Dieter Paulmann: Businessman to Conservation Frontiersman

Presenter: Andrew J. Wright, Leviathan Science; Okeanos

Successful businessman Dieter Paulmann grew a love of the ocean and whales through his hobby of sailing. He began making underwater films of whales, developing a commitment to preserve the ocean. Money from the sale of his company founded two organizations. Dokumente des Meeres was established to educate the public about human-produced underwater noise through a feature length film. Okeanos – Stiftung für das Meer (Foundation for the Sea) facilitates research and discussion on the frontiers of conservation science and policy, especially regarding ocean noise. In 2008 Okeanos sponsored a workshop about shipping noise with participation from ship builders and owners and, most notably, the International Maritime Organization (IMO). This diverse group jointly called for voluntary guidelines for reducing ship noise by 90% over the next 30 years, inspired a submission to achieve just this by the U.S. government to the IMO. The IMO then began the first substantial steps to address the problem: remarkable progress just 6 months after the workshop and proof of what one dedicated individual can accomplish. Okeanos also sponsored two successful workshops in 2007 on the spatio-temporal managing of noise and on stress caused by noise. Two further workshops on cumulative impacts from noise and other threats and on technological alternatives to seismic airguns are planned for August 2009.

Further Reference: <http://www.okeanos-stiftung.org/okeanos/foundation.php?lang=en>

## 12) Reefscaping: An Ecological Catalyst for Sustainable Socio-Economic Alternatives in Coral Reef Areas

Presenter: Thomas Le Berre, Seamarc Pvt. Ltd.

Developed in the Maldives, coral trays are structures enabling an easy transplantation of coral fragments and their growth into full grown colonies. With a very small final weight ratio between structure and coral skeleton, they will turn into an actual reefscape in a suitable environment within 2 years, creating habitat for associated species and speeding up natural reef processes. Our project at the Four Seasons at Landaa Giraavaru started in 2005 during resort construction and with over 1000 m<sup>2</sup> of structure and 40 000 fragments transplanted and densely grown, demonstrates that large expanses of reefs can be created relying only on second generation fragments. Requiring important man-power, this technique can be developed at local level providing alternative livelihoods to local communities. Four steady jobs have been created on the remote island of Fulhadhoo (250 souls). A number of detrimental activities taking place on the natural reefs can be shifted to these maricultured reefs and a number of additional benefits are expected from the development of new applications. Most of all, the activity itself is a great way to rally stakeholders around a common goal, spread awareness and finally increase practical knowledge about these essential building blocks that corals are.

Further Reference: [www.reefscapers.com](http://www.reefscapers.com)

## 13) Beyond Bad Grades: Eco-Health Report Card Incites Bold Conservation Response in Belize

Presenter: Melanie McField, Smithsonian Institution; Healthy Reefs for Healthy People Initiative

The first step on the road to recovery is admitting you have a problem. The first Eco-health Report Card for the Mesoamerican Reef (MAR) forced regional decision makers to look clearly and honestly at the current condition of their reefs. It incorporated a straightforward grading system from 'very good' to 'critical', based on seven reef indicators. The grades were shocking to many leaders in the region. More than half the 326 reefs sites were compromised, with 47% in poor and 6% in critical condition. A mere 6% of sites were in good condition — and none were "very good". Many reefs (42%) were in fair condition and could easily change for better or worse, depending in part on the strength of management actions. This was the crux of our "fierce urgency of now" message. After only four months, the following recommendations have been implemented in Belize: the establishment of 27,750 acres of new "no-take zones"; complete protection of parrotfish and surgeonfish, and a ban on spearfishing in all marine reserves. A combination of multimedia products are being used in this effort: a sexy poster, compelling videos, a lively song, and the vibrant printed Report Card. Subsequent Report Cards will measure our progress in actually regaining reef health, while Conservation Audits keep track of progress implementing the rest of the recommendations.

Further Reference: [www.healthyreefs.org](http://www.healthyreefs.org)

## 14) From Bleak to Bright: Changing Outlook for Hawksbill Turtles in the Pearl Cays, Nicaragua

Presenter: Cynthia J. Lagueur, Wildlife Conservation Society

In 2000, the Wildlife Conservation Society (WCS) initiated a conservation program for the critically endangered hawksbill turtle (*Eretmochelys imbricata*) population nesting in the Pearl Cays, Nicaragua. Results from our first surveys revealed that nearly 100% of the eggs laid were poached, nesting females were killed whenever they were encountered on the nesting beach, and hawksbills of all sizes were captured in local fisheries and killed for their meat and shells. The long-term outlook of this population was bleak if trends continued. We shared results from our first surveys with local communities, and they agreed that conservation measures were needed. Since project initiation, the number of clutches laid has increased from 154 in the first year to 249 in 2008. Poaching levels have decreased to less than 20%. As a result more than 126,500 hatchlings have been produced since 2000. For the first time, local fishers have reported the sighting of post-hatchling hawksbills, and sightings of small juveniles in the Pearl Cays area are much more frequent. The hawksbill population in the Pearl Cays is showing clear signs of increase, and this success can be attributed in large part to the participation of local residents in conservation activities, and communication with local communities about the successes and continuing threats hawksbills face in the Pearl Cays. Although there is much more work to be done, conservation efforts for hawksbills are having a positive impact, and the long-term outlook for this critically endangered animal has improved considerably.

## 15) Banco Chinchorro Biosphere Reserve: 10 Years of Work

Presenter: Bárbara Reveles, Quintana Roo Renewable Energy Society, A.C.

After ten years of work at the Banco Chinchorro Biosphere Reserve, in the Mexican Caribbean, we have success histories; mainly based on the establishment of rules as a result of the team work formed by fishers and authorities. The result of this work was the Management Plan. Following the fishers concerns regarding the conch and lobster depletion, our main task was to put together the since and 40 years of fisheries knowledge, and finding new economic alternatives giving as a result a better knowledge of lobster and conch and development of a Lobster Management Plan for Quintana Roo. Changing fishing gear catching only alive lobsters meant an attitude change giving as result a better economical option in the commerce of the lobster. As a conclusion we have learned the authorities and fishers must work together to preserve the natural reserves in a sustainable way.

## 16) Junior Ecoguard Network: The Key to Future Sustainable Environmental Education in the Comoros

Presenter: Chris Poonian, Community Centred Conservation (C3)

The Union of the Comoros (Grande Comore, Anjouan and Mohéli) is one of the world's 'hotspots' for biodiversity. However, this biodiversity is threatened, particularly in coastal areas, by anthropogenic threats caused by intense demographic pressure, a lack of infrastructure and a paucity of knowledge. To raise environmental awareness, especially amongst younger generations, the 'Junior Ecoguards' were established in 2006 in the village of Niomachoua, within Mohéli Marine Park. These young environmentalists were trained in marine environmental management, protection of endangered species and awareness-raising. Activities to date have included outreach events within local communities and nightly patrols of beaches to reduce turtle poaching. The programme has developed into a long term initiative with the goal of establishing a network of young environmental leaders in communities throughout all three islands, and a second branch was established on Grande Comore in 2008, raising awareness through village presentations and theatre and participating in the International Water Association's World Water Monitoring Day 2008. The next step is to ensure that the flow of knowledge continues by encouraging current Junior Ecoguard teams to assist with the training of subsequent groups to create an effective, self-sustaining network throughout the archipelago. We believe that by creating leadership capacity among the youth we can assure the future and sustainability of environmental education programmes in the Comoros.

Further Reference: <http://www.c-3.org.uk/English/Comoros/Projects/yelp.htm>

## 17) Participatory Initiative to Protect Key Marine Ecosystems in Ecuador

Presenter: Soledad Luna, Nazca Institute for Marine Research

The Galapagos now have a mainland counterpart on Ecuador's northern coast: the Galera-San Francisco Marine Reserve. This area holds the last remnants of the Chocó-Darién-Tumbes-Magdalena hotspot and features an outstanding variety of coastal and marine habitats, including mangroves, estuaries, rocky reefs, and coral patches. However, these ecosystems and their high biodiversity are threatened by overfishing, habitat destruction, deforestation, pollution, and uncontrolled coastal development. Local residents are dependent on natural resources for their subsistence, and artisanal fishing is one of their main activities. Unsustainable fishing practices have resulted in the collapse of marine resources, jeopardizing the biodiversity of the area and the well-being of the local community. Stakeholders and authorities have organized a participatory committee to effectively implement and manage the MPA. This committee is developing a management plan with specific and effective management actions, fair economic alternatives and governance models that will promote the marriage between conservation and sustainable local development. Conservation agreements will facilitate the implementation of priority conservation activities by providing benefits to stakeholders to compensate for the costs of conservation. The declaration of Galera San Francisco as an MPA was the product of a ten-year effort that began with the fishermen's concerns about diminishing resources. Although this effort is just beginning, the strong local involvement is the key to success.

## 18) A story of Success after 33 Years Protecting the Totoaba in the Upper Gulf of California

Presenter: Ernesto A. Chávez, Centro Interdisciplinario de Ciencias Marinas, IPN

The totoaba (*Totoaba macdonaldi*), is a fish endemic to the upper Gulf of California, legally protected since 1975. Fishermen claim that the stock has recovered requesting to legalize its exploitation. An assessment of its biomass was done. Incidental catch and length-frequency data of totoaba were used for calibrating the stock size, so the effect of some exploitation scenarios were evaluated. The evidence suggests that despite incidental catch, totoaba seems to tolerate some additional fishing mortality. The reconstruction of the population suggests that the stock biomass has been recovered to higher levels than those in the early 40s when its capture approached 2,500 tonnes. It is believed that a practical way to control and monitor the status of the current stock would be through the authorization of a reduced catch quota with the participation of observers on board of the artisan and commercial fleets; this would allow to determine the best exploitation strategies. A fee for each adult to be caught by the sport fishery is proposed to create a fund to finance the participation of observers and the scientific research for a permanent program of assessment and monitoring the status of the stock.

Further Reference: [www.cicimar.ipn.mx](http://www.cicimar.ipn.mx)

## 19) Community Conservation of Basking Sharks in the Isle of Man, British Isles

Presenter: Fiona Gell, Wildlife and Conservation Division, Isle of Man Government

The Isle of Man, a small jurisdiction in the British Isles, is a hotspot for basking sharks, the second largest fish in the world. This plankton-eating shark grows to the size of a bus and while it is protected in the Isle of Man, it is captured in fisheries elsewhere and vulnerable to accidental capture and injury. Close collaboration between non-governmental organisation, Manx Basking Shark Watch (MBSW) and the Government Wildlife Division, together with strong community involvement have led to effective conservation of basking sharks. The public report sightings to MBSW, building up an invaluable dataset on distribution. Sharks are protected from disturbance and injury and the public also report incidents of concern. The law was strengthened to protect basking sharks from harassment and training for boat operators promotes a Code of Conduct. Research by MBSW revealed that a basking shark tagged in Manx waters crossed the Atlantic, the first recorded basking shark trans-Atlantic crossing. This has highlighted the urgent need for international co-operation in research and conservation. In the Isle of Man, basking sharks have become the icon of marine conservation and the community has been mobilised to act to protect basking sharks and the wider marine environment.

Further Reference: [www.manxbaskingsharkwatch.com](http://www.manxbaskingsharkwatch.com)

## **20) Fishermen and Conservationist Working Together: The Central Coast Groundfish Project – An Innovative Model off California's Central Coast**

Presenter: Michael Bell, The Nature Conservancy's Central Coast Marine Project

Fishermen and conservationists have a long history of clashing in environmental battles, yet after a dramatic decline in fish landings hit Morro Bay, the two sides realized that working together might be the only way to save the local groundfish fishery. Collaboration among these unlikely partners began when The Nature Conservancy and local fishermen successfully petitioned fishery managers to establish 3.8 million acres of No Trawl Zones off California's Central Coast. Building off of that collaboration – the Conservancy, fishermen and community leaders of the Central Coast, along with scientists and state and federal agencies, are now working to transform the harvest and business model of the local groundfish fishery to greater economic and environmental sustainability.

## **21) It's turtles all the way down!**

Presenter: J. Frazier, Conservation & Research Center, Smithsonian's National Zoological Park

An oft-repeated anecdote about the origin of the universe ends with the impassioned declaration, "It's turtles all the way down!" Independent of whether the universe really is supported on the back of a turtle, these animals unquestionably play a major supporting role in ocean conservation. Turtles have many unique biological characteristics that make them attractive to researchers and the general public. Over the years, an extraordinary amount of research on marine turtles has been generated, much of which has transcended natural history and ecology and branched into a diversity of other disciplines, from molecular genetics to oceanography. Turtles serve as ocean ambassadors: studies on them have prompted research on a wide diversity of marine organisms and environments. This type of information is fundamental to educating the public and policy-makers about the importance of marine environments. Examples from around the world show a common tendency with projects originally focused on turtle investigation to take on wider research topics, then assimilate conservation initiatives as top priorities, integrate public education into the primary activities, and gradually take on different types of activism. Thanks to these lowly reptiles, in many countries, active research and conservation activities have evolved into effective education programs promoting the value of ocean conservation.

## **22) BeringWatch: Internet Facilitated Community Based Monitoring in the Bering Sea**

Presenter: Stephen J. Insley, University of Victoria

Community based observations of marine mammals and their habitats can be a valuable source of information aiding conservation and management decisions. Our goal has been to facilitate community based ecological monitoring in Bering Sea native villages. We combined existing environmental databases with a web-based access portal resulting in a system for remote communities to record and communicate local environmental and ecological events. We refer to the system as BeringWatch. The existing databases were developed and refined over the past 10 years by the Tanam Amgignaa (Island Sentinel) Programs on St. Paul and St. George Islands, Alaska. Two key features of BeringWatch are its internet home and its network design. There are two basic categories of environmental data: wide ranging descriptive data and detailed observations of specific species. The first category can be entered by anyone in a community with minimal training and is primarily narrative with supplementary photographs or video (e.g. environmental anomalies or local and traditional knowledge). The second category involves training and setting up a species specific protocol and is most likely to only be carried out by dedicated and often paid observers such as the Sentinel Programs on the Aleutian and Pribilof Islands.



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