
save our seas
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About Save Our Seas

In less than 10 years, the Save Our Seas Foundation (SOSF) has become a key player in the battle to save the world's oceans and the wealth of marine life they contain. From being a small non-profit organisation funding only five projects, the SOSF has evolved into what it is today, a strong force providing financial and, equally important, practical assistance to over 180 marine research and conservation projects all over the world. There can be no balance in the oceans without sharks. The SOSF aims to understand and protect larger shark species and increase public awareness. It also supports projects involving education, marine mammals, turtles and marine parks.

"As long as there are people who care and take action, we can and will make a difference."

The Founder, Save Our Seas Foundation

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A WORD OF INTRODUCTION

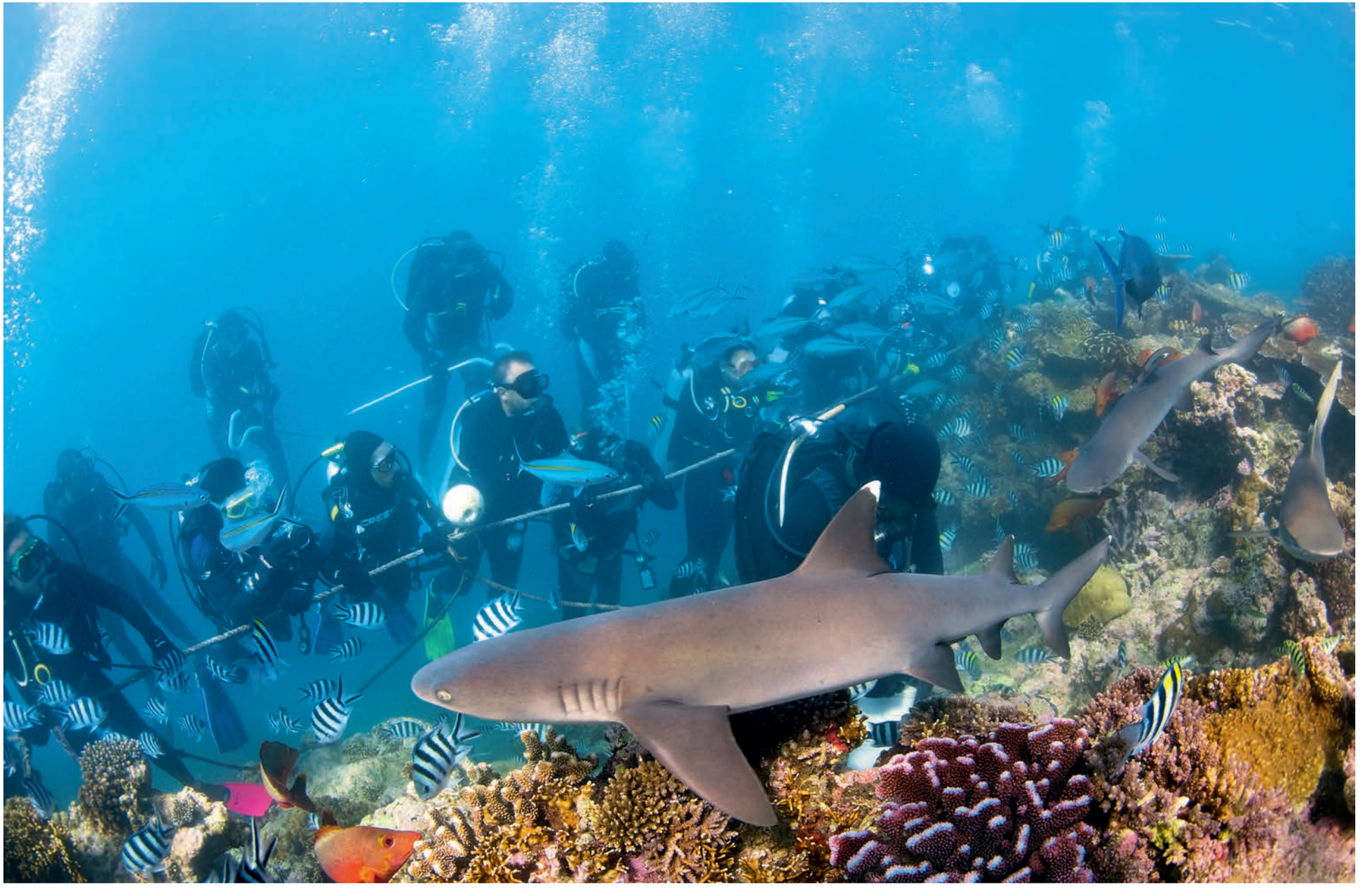
2012: TURBULENT TIMES FOR THE OCEANS

During the (nearly) ten years of its existence, the Save Our Seas Foundation has supported over 180 projects worldwide. Many of those projects have focused on gaining new knowledge about marine life through observation, shark tagging and laboratory work. Others have been examining our relationships with responsibilities to the ocean through education, with a focus on the younger generations and government policies. In 2012, the Foundation extended its efforts in both areas, to change public views on the oceans and its inhabitants, as well as to intensify the efforts of project leaders who work in the field of environmental policy and fisheries management.

The demand for fish, shark fins and other marine products remains high. Marine pollution is still increasing. The Foundation will continue its work to Save Our Seas by promoting innovative research to address these pressing and long term issues. In 2012, the Foundation acquired the management of the D'Arros Island Group in the Seychelles, where it had already supported several projects on ocean conservation and education. This project builds upon the Foundation's strengths and will offer new research potential.

The Foundation also saw a transition at the end of 2012 with CEOs Peter Verhoog and Georgina Wiersma moving on to new challenges and projects. They are succeeded by biologist Michael Scholl, who has been working on shark conservation for more than a decade in South Africa and around the globe.

In this review, the Foundation presents its projects, which inspire hope in marine conservation. Nine project leaders present their personal stories and their work. They are supported by Save Our Seas - to save our seas.



BALANCING ACTS

Ocean wildlife supports local and international economies and attracts the tourism industry dollars of snorkelers, divers and recreational anglers. However, human demands are growing, and growing. Overfishing not only harms ocean wildlife, but also damages fisheries, coastal and national economies, and ecosystems. The overfishing of sharks makes matters even worse as they play a crucial ecological role. Sharks are at the top of the food chain in virtually every part of every ocean- they keep other fish populations healthy and the marine ecosystem in balance.

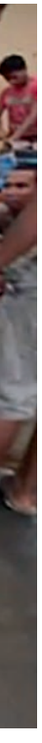
Sharks are a delicate delicacy

Perhaps as many as 100 million sharks are killed every year, many of them mainly for their fins. The fins of an estimated 26 to 73 million sharks entered the international fin trade in 2000 alone – and the demand for shark fin soup has risen sharply since then. Meanwhile, concerns about the unsustainability of global fisheries and declining shark stocks has also been rising. Sharks are slow-growing animals. They mature late and produce relatively few young, making them particularly vulnerable to overfishing. Sharks are, therefore, excellent indicators of overfishing; the worse the status of shark populations becomes, the more likely other fish stocks will also be in deep trouble.

Global stocks of the oceanic whitetip shark have decreased alarmingly since the international market demand for shark fin began to boom in the late 1980s (although this large species contributes less than 2% to the total shark fin trade). Most estimates of stock declines indicate that populations have fallen to under 10% of their original levels in the North Atlantic, Central and Eastern Pacific and Indian Oceans, and that the average size of sharks has halved – a key indicator of overfishing. The three largest species of hammerhead sharks, which make up almost 6% of the global fin trade, have also declined to a similar extent.

The findings suggest that bans on finning (the practice of slicing the fins off a shark and dumping its body back into the sea) and some recent prohibitions on landing the most threatened species are not yet helping to reduce the numbers being killed. Meanwhile, the demand for shark fin soup is likely to continue to grow and most purchasers of this delicacy are unaware of the impact of their consumption. **This highlights the dire need to educate the public and decision-makers better about the importance of sharks and the threats that they face** – it will take more than some national and regional

Slaughtered sharks



fisheries regulations to slow these trends; ultimately, reducing the demand for shark products is the only measure that will reduce catches to safe levels. The Save Our Seas Foundation has been supporting a variety of education and advocacy projects working on mitigating the impacts of both supply and demand: aiming to improve conservation policies and the efficacy of fisheries management measures for sharks, and to reduce the consumption of shark fin soup.

Managing international trade

As we go to press, countries and non-governmental organizations are preparing for the 16th meeting of the Conference of Parties to the Convention on International Trade in Endangered Species (CITES), which is being held in Bangkok in March 2013. An unprecedented 38 countries (including the 27 Member States of the European Union) have made proposals for improvements of shark and ray protection policies through CITES. Oceanic whitetip sharks, the three largest hammerheads, porbeagle sharks, the manta rays and three species of South American freshwater stingray will be considered for listing in Appendix II, while the freshwater sawfish is being proposed for uplisting from Appendix II to Appendix I, which bans all commercial international trade.

The four shark species proposed for listing are primarily threatened as a result of the past few decades of booming international fin demand. The fifth, the porbeagle, is slightly different – not only its fins but also its highly valuable meat have been traded since at least the 1960s. These listing proposals are being resubmitted to CITES after being rejected at the last Conference of Parties in 2010 – unfortunately their status has not improved during the past few years. Freshwater stingrays are threatened, at least in part, as they are being harvested for the poorly regulated international ornamental fish trade. Despite this subject being discussed by CITES Parties for several years, this is the first time a ray species has been proposed for listing.

The Save Our Seas Foundation has been supporting manta ray research for many years, but these huge filter-feeding animals have only recently received international conservation attention as they come under threat from an unexpected angle. While traditional small-scale fisheries have occasionally taken small numbers of manta rays for their meat, there is now significant demand for their gill-plates (the structures used to filter their planktonic diet), as they are a novel remedy in Traditional Chinese Medicine. In 2011 both species of manta were **uplisted to Vulnerable on the IUCN Red List**, and the giant manta was included in the Appendices of the Convention on Migratory Species of Wild Animals (CMS). Several Save Our Seas supported scientists were instrumental in achieving these results, and have since been advising the proponent countries on their proposal to regulate the gillraker trade through CITES.

Although freshwater sawfish fins are valuable, it is its tooth-studded rostrum that makes this animal desirable, both as a crowd-pulling live exhibit in public aquaria and as a curio. The six other Critically Endangered sawfish species are already listed in Appendix I. The Save Our Seas Foundation has been funding the IUCN Shark Specialist Group's work to develop a *Global Strategy for Sawfish Conservation* for this most threatened family of sharks.

The turtle race

Turtles will always be vulnerable – females have to come ashore to lay their eggs, where they can be easily killed for their meat or shells, their eggs collected, or their nesting habitats damaged. Population recovery, even after strict legal protection, takes a very long time for animals that take 20–40 years to reach maturity, and which continue to be killed at sea as an accidental fisheries bycatch. Hawksbill turtle populations were very seriously depleted because of the high ornamental value of their shells and are still Critically Endangered, despite some recovery since the 1990s. Leatherback turtle populations are slowly recovering in the Atlantic Ocean, but the remaining populations in the Pacific may become extinct. Some threatened populations of loggerhead and ridley turtles have turned the corner in USA, Mexican and Australian waters, thanks to strict protection and the introduction of mandatory Turtle Excluding Devices (TEDs). TEDs are grids that allow turtles to escape unharmed from the trawl nets that formerly drowned so many of them. They have been so successful that their use is being considered by additional countries. For example, Save Our Seas supported scientist Nicolas Pilcher is working in close cooperation with Malaysian authorities, training their experts, in order to support Malaysia's own sea turtle conservation initiatives.

Stop milking marine mammals

It is estimated that fewer than 10,000 West African manatees survive in the wild. They are distributed across 21 countries, where they face threats from hunting (often driven by human poverty), accidental catch in fishing gear, and habitat destruction. Save Our Seas is funding a long-term project to address these threats and improve understanding of this poorly known, threatened species. The aim is to build a network of trained African researchers who will collect critically needed scientific information and promote grassroots conservation actions in every country where the manatee occurs. Projects like this, focused upon building the capacity of locals, in their own countries, are the best way to make sure that such iconic species are saved.

A new SOSF marine mammal project on the other side of the world demonstrates researchers working in cooperation with a local indigenous community, the Gitga'at First Nations, to secure the future of the critical habitat for orcas – and for the First Nations tribe that share these waters (see page 12).

The evil twin of climate change

Surely everyone has heard about rising carbon dioxide (CO_2) levels and global warming: the melting ice sheets and glaciers that threaten coral atolls, turtle nesting beaches, entire small island states and some of the world's largest coastal populations; and the rising sea temperatures that cause coral bleaching? Fewer, however, have heard about the other, even scarier, side of climate change: ocean acidification.

Global warming would be far more severe today if it were not for the world's oceans, which have already absorbed about a third of the CO_2 produced since the start of the industrial revolution. However, this important function comes with its own alarming cost. CO_2 increases the acidity of seawater, and acid water dissolves calcium carbonate – the material used by so many marine animals, from microscopic to enormous, to build their shells. These animals underpin most of the food chain, and the threat posed by rising CO_2 levels has frightening implications not just for ocean wildlife, but also for mankind as marine capture fisheries provide the world with almost 80 million tons of food. Small scale fisheries employ more than 90% of the world's fishers and provide a vital source of protein to billions of people living along the coastal fringe. We cannot afford to lose them.

The project funded by SOSF is studying sites with naturally high levels of CO_2, such as those near underwater volcanic vents in the Mediterranean, in order to form a better understanding of the consequences of allowing the oceans to become more acidic, and to spread the word about the importance of tackling climate change.

So what do we do??

Save Our Seas is committed to ocean conservation, with a strong focus on sharks and rays.

The Foundation believes it is crucial to work with local communities and that education plays an important role in this. Save Our Seas is therefore setting up a variety of education programmes around the world and developing educational materials in collaboration with local partners.

The genetic work conducted by the Save Our Seas Shark Centre in Fort Lauderdale (USA) plays an important role in assessing the structure of global shark stocks and supporting fishery and international trade management. The Save Our Seas Shark Centre in Kalk Bay, South Africa, reaches thousands of schoolchildren each year and plays an important outreach role in the local community. In the Seychelles, educational programmes have been established at both primary and secondary school level, with opportunities now being developed for training marine rangers.

In 2012, Save Our Seas supported the travel costs and registration fees of 16 scientists, enabling them to present their work at important conferences in Australia, Canada and the United States.

Some Save Our Seas supported scientists have dedicated their life and work to research, some to educating a wide audience through the development of media materials. Many of them work with local fishing communities, looking for ways to protect the oceans and its inhabitants, while simultaneously preserving local cultures and livelihoods. Several Save Our Seas Supported Scientists act as advocates for sharks and rays when attending conventions and conferences and by supporting new regulations for fishing and conservation.

In this review, we present an overview of the year 2012: our work, our media successes and inspiring chapters about the involvement of divers and the public. We also present nine personal stories, written by Save Our Seas Project Leaders. Nine different stories, but with common factors: passion and dedication. All making a difference now and in the future!

MEDIA

2012 was a successful media year for Save Our Seas. News about projects supported by Save Our Seas was published in countless media, both online and offline.

Professor Mahmood Shivji (Director of the Save Our Seas Shark Center at Nova Southeastern University, Florida) and his scientific team built upon their remarkable discovery in 2005 of a 'cryptic' species of hammerhead shark in the western North Atlantic Ocean. It looks very similar to the scalloped hammerhead (Sphyrna lewini), but is evolutionarily completely distinct. This year, they used nuclear and mitochondrial DNA sequencing to prove that this cryptic lineage also occurs in the western South Atlantic Ocean, extending its distribution more than 7,000 km to the south of its only previously reported location. This breaking news was published in over **300 different newspapers and websites!**

The documentary **"Surfing and Sharks"**, directed by **Julian Watson** and **Chris Mason**, and supported by Save Our Seas, was shown at a whopping twenty-five film festivals. It received three prestigious awards: 1)Best Emerging Film Maker at the BLUE Ocean Festival, 2)Best Cinematography at the 35th Annual International Wildlife Film Festival, and 3)the Best Film at the Surf Film Festival in Hamburg, Germany.

The film **"Shark Riddle"**, made by **Laura and Robert Sams** with funding from Save Our Seas, received an award for Best Children's Program at the 35th Annual International Wildlife Film Festival, and won Best Children's Program Worldwide at the BLUE Ocean Festival.

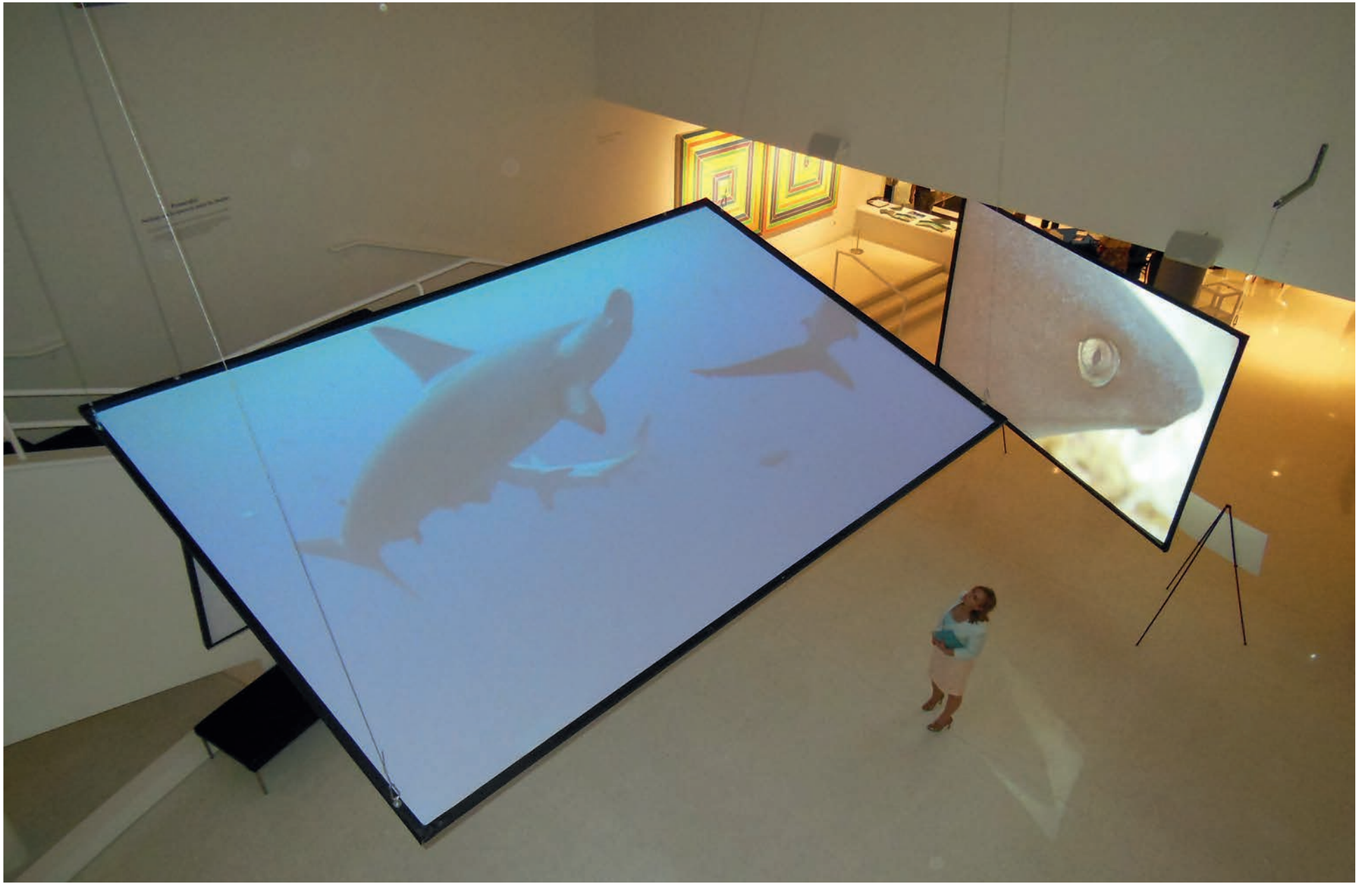
SOSF's webmaster and filmmaker **Stefan Kubicki** made an impressive PSA called **"90% Percent"**, highlighting that 90% of the big fish are already gone. It was released on World Oceans Day on June 8th, 2012, went viral on the internet, and was even shown 144 times during the famous **GEICO 400/Nascar** races, reaching 400,000 people in four days!

One of the major events co-funded by Save Our Seas was the **TEDx Seapoint Event** in Cape Town, South Africa, with the title **"Who Moved My Sushi"**. Twenty-seven speakers from all walks of life spoke about their passion for the ocean, and their efforts to protect our seas and its inhabitants. Famous South Africans, like **celebrity chef Justin Bonello, Paralympics medalist Achmat Hassiem and television presenter Dr Ellanor Yeld-Hutchings**, gave inspiring speeches. The crowd was wowed by every speaker!

A documentary about Save Our Seas Supported Scientist **Guy Stevens** and **'his' manta rays in the Maldives** was aired on November 11, 2012,

by the Australian Nine Network. Save Our Seas high-definition footage was used in productions by ZDF, ARD and the BBC.

Another highlight this year was the **SHARK! Exhibition at the Museum of Modern Art in Fort Lauderdale, United States**. Save Our Seas funded the production of all educational material, shark apps for iPhones and tablets, family guides, booklets and visitor brochures. High-definition footage of swimming sharks was shown on giant screens to give each visitor that special 'underwater feeling'. **SOSF Chief Photographer Peter Verhoog's** shark pictures were

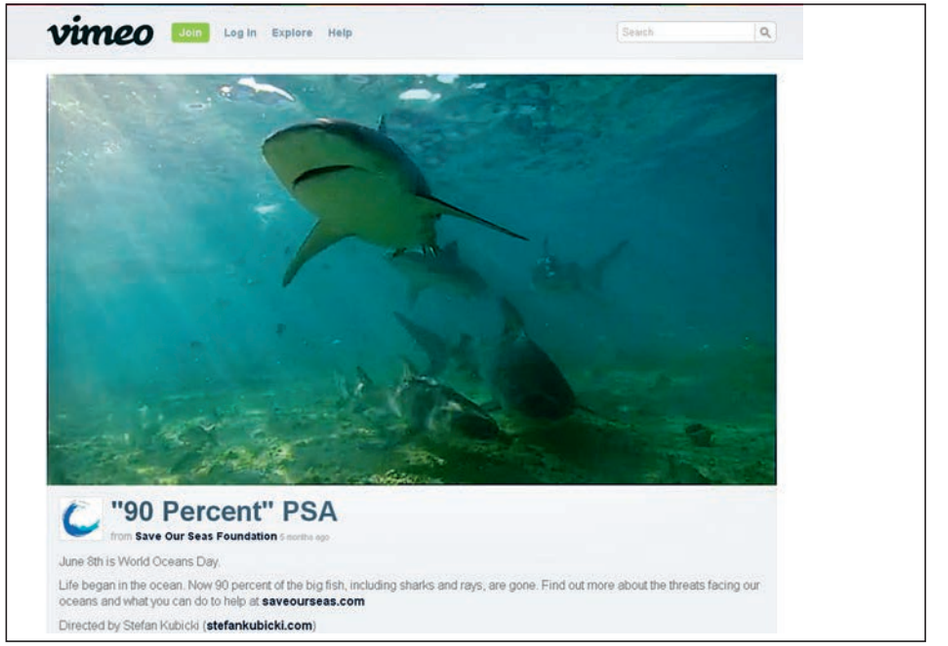


shown continuously. The Exhibition was extremely well received, and visited by dozens of school classes from all over the state of Florida.

The number of followers on **Facebook and Twitter increased dramatically, to over 13,000**. This is the result of all project blog entries and news stories being posted to the Foundation's social media accounts as well as on the SOSF web pages.

In 2012, a special media campaign was launched about the new **BRUV project in South Africa's False Bay** and about scientist **Lauren DeVos** who works from the Shark Centre in Kalk Bay (see also the Project in Focus chapter regarding this project). One of Lauren's videos went viral and was shown on CNN, NBC, in the National Geographic Kids Magazine, African Geographic, the New York Daily News, Discovery Channel's website, Good Morning America, Discovery Channel Canada, and was watched over 437,000 times online!

The new Save Our Seas Supported Film Project **"Turtle Diaries"** and **"Whalesharks in Mozambique"** will be ready in 2013.



SAVE OUR SEAS SHARK CENTER USA

CUTTING EDGE GENETICS RESEARCH IN A NEW FACILITY TO ADVANCE GLOBAL SHARK AND RAY CONSERVATION

Genetic techniques are well established in wildlife conservation and have also become indispensable tools for advancing the conservation and management of sharks and rays. Specific examples of genetic techniques applied to elasmobranch conservation can be found in the work conducted by the Save Our Seas Shark Center USA (SOSSC) in partnership with the Guy Harvey Research Institute. Both of these organizations are based at Nova Southeastern University in Florida and housed in a beautiful, new state-of-the-art research building.

Previous research discoveries by the SOSSC which have had a global impact on conservation include the development of rapid DNA forensic methods to identify the origins of shark body parts found in international trade. This ground-breaking work has found immediate application in shark conservation and management policies. These methods are being applied internationally and have enabled the US National Oceanic and Atmospheric Administration's Office for Law Enforcement to successfully identify and prosecute many perpetrators of illegal shark fishing and trading practices.

This genetics research was also a key element in a collaborative study led by Dr. Shelley Clarke of Imperial College, UK, which made the first quantitative assessments of the species of sharks traded in the global fin trade. DNA research conducted by the SOSSC has also led to the discovery of new species of large sharks and rays, including a hammerhead species that looks very similar to the scalloped hammerhead (*Sphyrna lewini*) but is actually a genetically distinct lineage! The SOSSC's discoveries have been widely covered in the international media.

The current SOSSC genetics research program (2011-2013) is focused on achieving three main goals:

1. Determining how many genetic populations of the main large shark species are exploited by global shark fisheries.
2. Expanding the scope of DNA forensic techniques to identify the species and population origin of shark body parts in global markets.
3. Obtaining an understanding of the white shark at its most fundamental level, by determining its genetic makeup and comparing it to that of other vertebrates, including humans.

Shark Population Research and Monitoring International Shark Trade

The high demand for shark fins and other products continues to drive the overfishing of already depleted shark populations and species worldwide. Although well-meaning management and legal measures have been implemented by some countries in an attempt to conserve specific shark species, many of those efforts have been in vain. There are two reasons for this. Firstly, inadequate monitoring of shark catch means that it is often impossible to determine which species are being fished and

the extent of their exploitation. Secondly, even when DNA forensic techniques are able to determine the species of sharks from their traded body parts, the population structure of most sharks at a global level is so poorly known that it is virtually impossible to determine the source of the population, and therefore the geographic area that the shark was caught in. This means that some shark species and/or populations may unknowingly be subjected to disproportionate and unsustainable levels of exploitation.

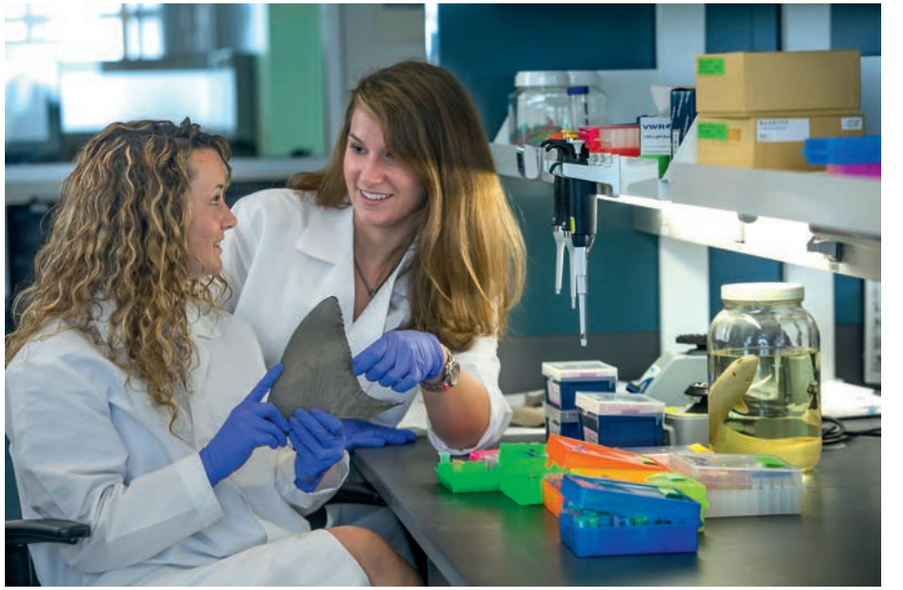
This situation needs to be addressed by providing all of the required information and tools for identifying both the species and the population origin of traded shark body parts, before certain species or populations are overfished to such an extent that their recovery becomes impossible. SOSSC research is showing that shark species with global distributions are typically made up of smaller genetic stocks than anticipated, each of which must therefore receive targeted management and, in some cases, even urgent protection by national laws to prevent further depletion. The discovery of discrete shark genetic stocks is also providing a firm basis for tracking the geographic origin of sharks already in international markets far removed from their capture locations. The information being provided is essential for developing tougher national legislation and international treaties to help the recovery of sharks on a global scale.

Deciphering and Understanding the White Shark at its Genome Level

Understanding how sharks work at the level of their genomes (i.e., their entire set of DNA) has the potential to lead to benefits for human health, in addition to contributing to a better understanding of shark biology in general. As the earliest-evolved jawed vertebrates, sharks can serve as important biomedical research models to further our understanding of the evolution and function of vertebrate (including human) biology and disease, such as immune systems, neurobiology, stem cells, aging and cancer biology.

For example, sharks have renal tissue regeneration processes that are more advanced than those in mammals. The remarkable ability of sharks to heal from significant dermal injuries is anecdotally well known by field researchers, and elasmobranchs are thought to have a notably low frequency of tumors, compared to mammals. The mechanisms underlying the regenerative and healing properties of sharks, although not yet understood, are likely based on their genetic makeup and function. This points towards the possible presence of novel genes in sharks, or differences in the way specific genes (some of which are shared with humans) function. Thus, understanding the content of shark genomes and how their genes function, in a comparative context to human and other vertebrate genomes, will illuminate our understanding of genetic mechanisms that enable rapid healing, efficient tissue regeneration and low incidence of tumors in sharks. These are all topics of major relevance to human medicine.

Exploring the potential connections that exist between sharks and human biology will also provide additional tools that can be used to raise public awareness of the importance of sharks and the urgent need to conserve them. Towards this goal, the SOSSC scientific team is conducting a focused effort to research the white shark genome. Results to date showing white sharks have novel aspects to their genetic makeup compared to humans and other vertebrates, have led the SOSSC team to expand their genome studies to other shark species, including hammerheads, tigers and silkys.



SAVE OUR SEAS SHARK CENTRE

KALK BAY, SOUTH AFRICA

The primary objective of the Save Our Seas Shark Centre is to encourage the conservation and awareness of sharks and marine life in the False Bay area of South Africa. The Shark Centre achieves this aim through dedicated educational programs and by supporting research projects and awareness raising initiatives with a particular focus on sharks as apex predators.

Research

The Save Our Seas Shark Centre is advocating several researchers in the development, running and expansion of new research projects on sharks and other endangered marine species and habitats, including projects funded by Save Our Seas.

Lauren De Vos is using Baited Remote Underwater Video Stations (BRUVS) in her research project to survey fish and sharks across all habitats in False Bay; Tamzyn Zweig's research aims to provide an up-to-date quantification of organized recreational elasmobranch fishing for better co-management of recreational and commercial fisheries in South Africa; and Meaghen McCord is investigating habitat usage by the Zambezi (bull) shark which was recently discovered living in the Southern Cape region of South Africa.

Education

A primary focus of the Save Our Seas Shark Centre is delivering educational and awareness raising programs to schools, social outreach initiatives and other interested groups in and around Cape Town.

The Shark Centre staff go beyond providing knowledge and new skills; they facilitate memorable and hands-on interactions with the marine environment. This is particularly important in the coastal city of Cape Town, where the vast majority of potential learners are often not given the opportunity to interact with marine environments or to explore their beauty.

The Centre offers lectures and interactive rockpool outings to school groups and social outreach initiatives throughout the year. It also organizes an annual Marine Awareness Holiday Camp and hosts popular and activity-filled children's holiday clubs in collaboration with other organizations.

Their engagement with the public at relevant environmental events is strong - providing educational talks on sharks, marine ecology and conservation.

Communication and Awareness

The Save Our Seas Shark Centre opens its doors to the public 7 days a week, offering visitors the opportunity to see small sharks and marine life in the aquarium, view marine documentaries and to get further general information on sharks and research.

The center staff and Save Our Seas Sponsored Scientists researchers regularly participate in environmental events including scientific lectures, exhibitions as well as beach and wetland cleanups.


Tamia

Furthermore, the Shark Centre hosts the Marine Conservation Speaker Series where influential local and international speakers and researchers share their knowledge and passion for sharks and marine conservation with the public.

By partnering up with other environmental and conservation organizations, festivals and events, the Shark Centre aims to raise shark and marine ecosystem awareness and to engage the public in shark myths and misconceptions, by highlighting their importance to the health of our oceans.

Using social media channels and a new electronic monthly newsletter, the Shark Centre actively connects with people and organizations, sharing information and news on upcoming events, research activities and educational initiatives.

By the end of 2012 The Centre has reached approximately 5,000 kids with its educational programme, kids holiday club, marine awareness camp and several expos.


THE SAVE OUR SEAS FOUNDATION


"As long as there are people
who care and take action, we can and
we will make a difference."

ACEH-WEH SEASCAPE

Project Leader: Stuart Campbell, PhD

Stuart has worked in the field of marine science and conservation since 1986, for a range of government and non-government organizations, spanning temperate, tropical and Antarctic environments. He has been Director of the Wildlife Conservation Society's (WCS) Indonesian Marine Program for the past eight years, making use of his experience in marine park management, community monitoring programs, and research into tropical marine ecosystems. He manages about 18 members of staff throughout Indonesia.

Stuart grew up away from the marine environment in the mountains outside Melbourne, in southern Australia. As a teenager, he travelled every year with his family down the Great Ocean Road in Victoria to spend a six week holiday living and camping in the sand dunes. Such areas nowadays are off limits to campers, as they are fully protected, but those times embedded a deep love for the sea and its marine life. As a PhD student, Stuart studied the impacts of sewage outfalls on marine life. "I always had an interest in the conservation of marine habitats, as I believe these impacts are great and often difficult to reverse, and they impact whole communities, not just single species."

More recently, whilst living and working on the coast of Bali, Indonesia, Stuart witnessed the destruction of many marine habitats as a result of invasions of crown of thorn starfish, coral bleaching, pollution and destructive fishing. These have been coupled with depletions of marine fauna, including, unfortunately, sharks and rays.

"We became interested in whale sharks off Aceh after we heard many accounts of visits by whale sharks to Pulau Weh, a small island 40km long off the western tip of Sumatra. For reasons unknown to local fishers and tourism operators, whale shark visitation rates reduced significantly after about the year 2000. While we

were working on a range of activities in Aceh after the 2004 tsunami, including education programs, coral reef conservation and marine protected area management, we also witnessed a return to fishing at unsustainable levels. With new boats and fishing gear, fishers who had previously taken reef species were now targeting sharks and rays in areas where sharks had not been fished for years. Many had learnt how to fish sharks from fishers who had relocated from areas where the tsunami had devastated their homes. In 2008 we invited Rachel Graham - WCS shark specialist - to help us investigate both whale sharks and this new management issue, and what she found was pretty disturbing. Many species of shark and manta ray were being landed at the Banda Aceh fish market. Many pregnant females, small sharks and many with their fins cut off were commonly seen at the market for sale. We realized we could not ignore such a sensitive issue and had to act. Given the poor attention to shark management not only in Aceh, but also across Indonesia, we believed it important to achieve improved models of management that could be applied not just to Aceh, but to the whole Indonesian archipelago."

The islands and coral reefs of the 250 square kilometer Aceh-Weh Seascape, situated at the northern coast of Sumatra, Indonesia, are biogeographically and globally important. They contain a diverse assemblage of coral reef species found in both the Pacific and Indian Oceans. The area boasts critical habitats and populations of large coral reef fishes, sharks, and rays, many of which are increasingly threatened by unsustainable and destructive fishing practices as well as global climate change.

"Our team, together with local communities and government bodies, has been leading the efforts to protect critically threatened species and habitats by developing a network of marine protected areas (MPAs) throughout the Aceh-Weh Seascape. In order for MPAs to successfully protect threatened fish and shark species, they must be a part of a larger strategy to manage unsustainable fishing practices. This project is complementing the ongoing MPA establishment in the Aceh-Weh Seascape by reducing the impacts of unsustainable fishing practices on coral reef fishes, sharks, and rays, and therefore increasing the resilience of marine habitats. Fishing activities target mostly sharks and rays during west monsoon season, with 53 per cent of the catches on the Aceh Islands dominated by sharks and rays."

WCS is combining scientific information with traditional ecological knowledge to reduce the level of unsustainable fishing practices. It does so through targeted education and awareness campaigns, training of local people in fisheries and marine protected area management, development of appropriate local fisheries management measures, and the identification of alternative livelihood options for local residents. Stuart says, "We are particularly keen to incorporate traditional ecological knowledge and scientific information of the ecology of sharks and rays into plans and regulations that will halt shark finning and blast fishing within the Aceh-Weh Seascape of northern Sumatra". In addition, he explains, "We have engaged governments at the national, provincial and local levels on the shark fishing issue, and our outreach program has targeted schools, communities, businesses, and governments. In 2011, we produced a video concerning shark fishing in Aceh and some footage was quite confronting. It has been shown to over 200 people and generated lots of interest and willingness by the government to start building a roadmap for management".

In 1999, the International Plan of Action for the Conservation and Management of Sharks (IPOA-Sharks) was adopted by the Food and Agriculture Organization (FAO). It is voluntary, but all shark and ray fishing countries are encouraged to implement the IPOA by developing a Shark Assessment Report (SAR) and a National Plan of Action (NPOA, or Shark Plan) to improve the monitoring and management of shark and ray fisheries. In 2010, Indonesia's Ministry of Marine Affairs (MMAF) released an NPOA for sharks and rays. The Indonesian Shark Plan describes six key actions for shark and ray management: reviewing the status of shark and ray fisheries in Indonesia; compiling methods and data collection; developing shark and ray research; improving management measures; increasing awareness on shark and ray fisheries; and institutional strengthening. To date, there has been little implementation of this plan; no tangible actions, specific policies, or regulations have been made for shark and ray conservation in Indonesia.

Stuart says: "Our project has evolved from raising awareness and the development of local fishing regulations to now developing the first pilot site for the implementation of Indonesia's Shark Plan". In collaboration with MMAF, WCS will facilitate meetings and workshops among national, regional, and local stakeholders to develop an action plan for the Aceh-Weh Seascape that addresses the key strategies of the Indonesian NPOA.

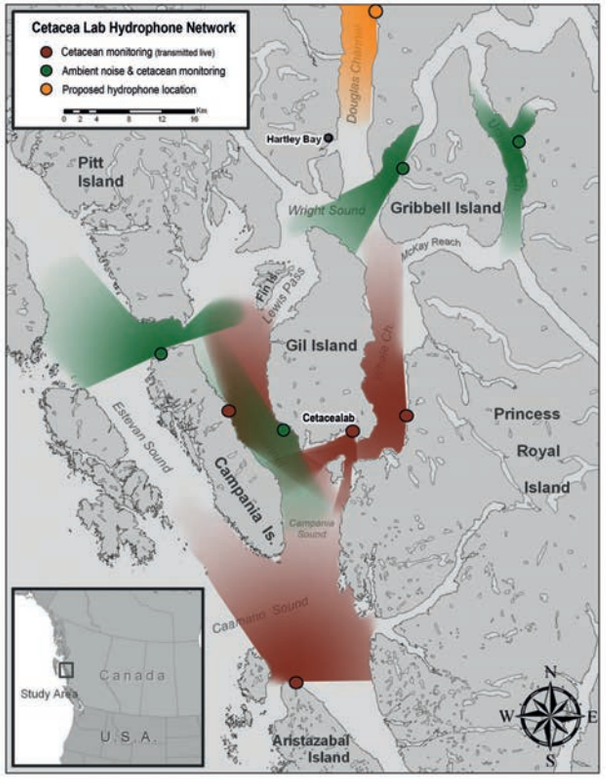
"SOS funding has been instrumental in allowing the collection of the first scientific information on shark and ray fisheries in Aceh, and combining this with traditional ecological knowledge to come up with practical controls on shark and ray fishing. We have identified important habitats for sharks, where bans on their fishing are being developed through marine spatial planning with support from communities and governments. SOSF has also enabled awareness of shark fishing to become forefront in the marine management programs in Aceh, and allowed us to work on a science-based shark and ray fisheries monitoring framework for the Aceh-Weh Seascape, to be adopted by district and provincial governments as part of their fisheries strategic plans. This will allow local stakeholders to review the status of shark and ray fisheries in Aceh-Weh and strengthen shark and ray fisheries management. Possibly the most important outcome of additional SOSF funding has been our ability to evolve the project, making Aceh a prime pilot site for further implementation of the National Shark Plan throughout Indonesia."

PROJECT IN FOCUS

IDENTIFYING CRITICAL HABITAT FOR KILLER WHALES

CAAMANO SOUND, BRITISH COLUMBIA

Project Leader: Janie Wray



At the age of nine, Janie Wray heard her first recording of an orca, or killer whale, and was instantly captivated and curious. This first emotional response to sound, as a young child, was the inspiration that led to a life-long commitment to understanding the vast communication skills and dialects of whales.

After graduating Janie continued her studies at Orcalab. Here she met her research partner, Hermann Meuter. They soon realized that they shared a similar dream: to build a research station in an area where whales thrive and the presence and impact of people was minimal. By 2001 they had discovered such a place, Gil Island. With permission from the Gitga'at band, the local First Nations community, they subsequently built the first and only marine facility (Cetacea Lab) along the remonorth coast of British Columbia. From this location, Janie and Hermann have established a network of hydrophone stations that transmit back to their laboratory, every minute of the day, the underwater world of whales. This unique structure has enabled Janie to collect an acoustic library of individual orca and humpback call types. When she is not in the lab recording whale calls, she is on the water collecting vital photographs of each individual orca, humpback and fin whale, with the aim to better understand the social bonds between whales and their use of this precious area, which she hopes to have designated as 'Critical Habitat'.

Project

In 2008, Janie and Hermann installed a hydrophone station at Ulric Point, on Aristazabal Island. The purpose was to listen into the vast waters of Caamano Sound; a candidate for Critical Habitat for orcas. At that time insuffi-

cient data was available for this designation; Janie was determined to change this. With this new station, a unique acoustic window into an unexplored marine corridor was now broadcasting back to the lab. Janie has the unique ability to identify different orca pods just by listening to their family-specific call types. Within the first month, she knew they had discovered a marine gateway for orcas. By the end of the first season of listening to the constant orca communication, both she and Hermann realized how vital the Caamano Sound region was for orcas. She also recognized that, with only acoustic information available, it was very difficult to identify the exact travel patterns, behavior and prey selection of the orcas within the hydrophone range. They needed to find a way to observe what they were listening to.

The problem was that even though Cetacea Lab is remote, uninhabited Aristazabal Island is even more so. The weather was also a huge factor, with constant gale force winds. However, there had to be a way. So, in 2009, with extremely limited funding, Janie and Hermann built a very basic shelter at Ulric Point. Janie spent most of that season sleeping in a tent, going weeks without seeing another person. She powered her radio with a small solar panel, and protected her food from the coastal wolves and bears using barrels suspended from the trees by a system of ropes. Her main companions were two eagles that were nesting close by, a curious family of mink, and her precious scope used to search for the orca. They were eventually fortunate to find an extremely dedicated intern to assist with the daily scans and to document all marine vessel traffic. When whales were sighted the focus moved to taking as many pictures as possible, to record which whales were present, and their social and foraging activity. The first season was a huge success, and the high number of orca sightings made every moment of hard work worthwhile.

The main reason the resident orcas frequent the waters of Caamano Sound is the availability of their favorite food source: the Chinook salmon. Caamano Sound is an essential migration route for Pacific salmon, and the orcas intercept the fish *en route* to their spawning grounds. Knowing this, and proving this, are two entirely different things. Janie had to find a way to collect fish scale samples to determine the exact orca prey source when foraging. In 2010, a major step towards this goal was achieved when the Gitga'at First Nations decided to help the Cetacea Lab in their efforts and teamed up with Janie to conduct boat surveys whenever orcas were sighted from Ulric Point. This collaboration has become a key component in successfully gathering the necessary data to protect orca habitat.

The living conditions at the remote camp were extremely basic and the equipment being used to collect the data was partially owned by third parties. But it was imperative to bring in a number of interns to participate as safety was a concern and the hours were long for just one person. All of that changed in the 2012 season when the Save Our Seas Foundation decided to fund this important research project. Everything, from better camera equipment, to viewing scopes and alternative energy sources, enabled us to continue on our path to understanding the movements and the sacred bond that orcas have with each other and their habitat.

Janie hopes that, with continued funding, she and her research partner Hermann will have gathered sufficient data in the next few years to convince the Canadian Federal government to declare Caamano Sound a Critical Habitat for orcas.

BAITED REMOTE UNDERWATER VIDEO (BRUV) ASSESSMENT OF FALSE BAY ICHTHYOFAUNA

Project Leader: Colin Attwood

Colin Attwood grew up during a time of rapid resource diminishment. He loved fishing, but at the same time experienced an enormous sense of loss. Wherever he went, the old-timers spoke of the better fish they used to see, and the inexplicable changes in the environment. Coastal resources in South Africa in the 1960's were still highly abundant, but by the 1980's, the impacts of overfishing were clear. Fishing became gradually less rewarding, and the stories that he read in fishing books seemed unrealistic. Trying to understand this loss became his life's work. After graduating with a PhD in fisheries science, he worked for the South African government and was instrumental in establishing several marine protected areas (MPAs), which now form the backbone of South Africa's marine conservation strategy. Colin currently works at the University of Cape Town as an Associate Professor, where he conducts research into fish monitoring methods and fisheries management.

In 2011 Colin supervised a MSc project by Lauren de Vos, with the help of Dr Albrecht Götz of the South African Environmental Observation Network. The aim of the project was to survey the newly proclaimed Stilbaai MPA using the baited remote underwater video (BRUV) method. BRUV surveys were developed in Australia, and are now used worldwide for a variety of projects. It is a non-extractive technique and BRUVs have a low environmental impact. By attracting fish into the field of view of a remotely-controlled camera, they record the diversity, abundance and behaviour of species, and can be used to monitor changes in fish numbers and diversity over time.

In South Africa, the practicality of BRUVs extends beyond pure scientific interest: they meet the need for affordable and efficient monitoring of fish populations. With an inshore fishery that has been exploited for over 200 years, many species in South African waters, from sharks and rays to bony fish, are in serious decline. A good understanding of the conservation status of these species is essential if managers are to address this situation. For example, South Africa's marine protected area (MPA) network relies on fish surveys as a means to understand how effective protected areas are in achieving biodiversity conservation goals. However, very few species have been adequately monitored because of the high costs and the difficult logistics. South Africa's marine protected area (MPA) network relies on fish surveys as a means to understand how effective protected areas are in achieving biodiversity conservation goals. Developing a more cost-effective, time- and labour-efficient method of surveying fish species is integral to ensuring that long-term monitoring is sustainable along the South African coastline.

After their initial experience in Stilbaai, Colin, Lauren and Albrecht designed a streamlined version of the method to obtain a greater quantity of data, cheaply and efficiently. To achieve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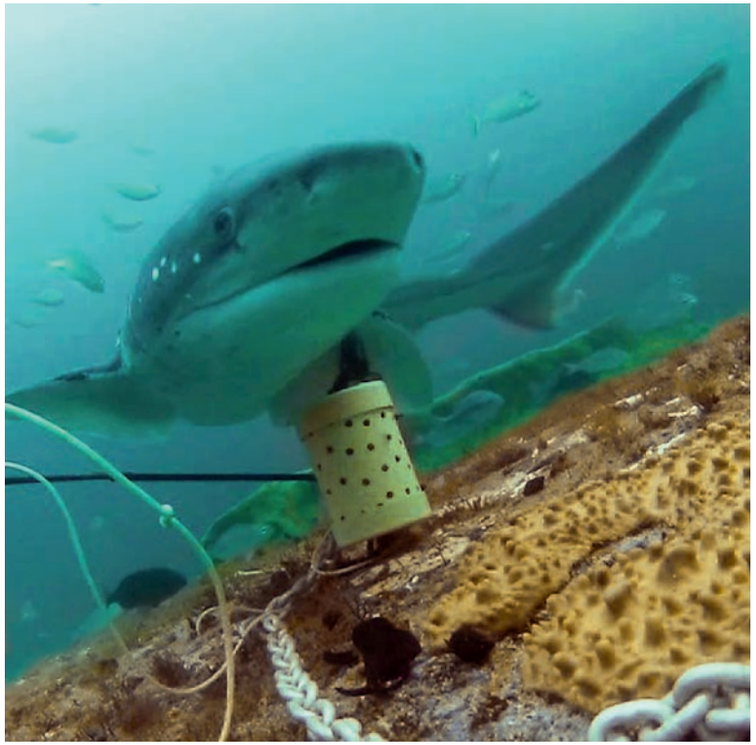


their objectives, they focused on the iconic waters of False Bay, South Africa's largest true bay. Thanks to SOSF funding, the False Bay BRUV project has introduced simple steel rigs with GoPro HD cameras attached to them. They are buoyed off at the surface and left to film the sea floor for one hour, independent of boat cover. This reduces the manpower required for fieldwork, the cost and complexity of the equipment, and maximises the amount of data collected on any given day. The methodology can be replicated by conservationists along the coastline and utilised in standardised monitoring. The first underwater camera survey of False Bay's fishes, including its rays, skates and sharks is gathering information on the region's species. These are being archived and can be used in long-term ecosystem comparisons. With a long history (over 400 years) of fishing activity, False Bay presents an important and interesting site for the development of a BRUV monitoring system that is a practical, realistic option for fishery and MPA managers' budgets.

False Bay also represents an important opportunity to achieve awareness of marine conservation issues. Utilized by a host of ocean-lovers, from surfers and the boating community to fishers, divers and paddlers, False Bay is located on the fringe of a growing urban population. The BRUV project represents a unique opportunity to bridge the gap between researchers and the public, using video footage to communicate the beauty of the underwater realm and the challenges it faces. The footage makes data a visual reality and can reinforce awareness outside the scientific community. Progressive and practical research is a basis for management and decision-making, and conservation efforts in our marine realm can, and will, be realised.

The Save our Seas Foundation has allowed Colin, Lauren, Albrecht and their team not only to document fish life across False Bay, but to develop a methodology that will directly influence the future of sustainable coastal fish monitoring in South Africa. More poignantly, the project has allowed South Africans to "dive in" and accompany the researchers in their exploration of False Bay's magical underwater world, lifting that shimmering blue expanse of sea and providing an "underwater eye" to capture this ocean's remarkable inhabitants.

MARINE MEGA-FAUNA

AUSTRALIA

Project Leader: Mariana Fuentes

Mariana Fuentes is a marine biologist who is eager to make a difference. Her passion for marine mega-fauna and her concerns about their future has prompted her to develop a research program that addresses real-world issues and focuses on connecting people to science, to make effective changes. Most of her research to date has focused on the development of science-based solutions for the conservation and management of marine turtles in a changing world. In addition to Australia, Mariana's work has taken her to Madagascar, Vanuatu, Kenya, the United States and Barbados.

Mariana's passion for marine turtles began during her internship at Projeto Tamar (a sea turtle group in Brazil). Since then, she has been committed to the conservation of marine turtles by working across the globe with various international organizations; they seek the conservation of marine turtles, conduct applied research to provide key information for the prioritization of marine turtle management, and instigate environmental education programs to bring awareness of issues related to marine turtle conservation. Mariana's PhD investigated the vulnerability of the largest green turtle population in the world, the northern Great Barrier Reef (nGBR) green turtle population, to climate change. One of the outcomes of this research was the development of a systematic and comprehensive framework to assess how multiple climatic processes will affect marine turtle nesting grounds at a population scale.

Results from this research are being consulted for the (future) management of marine turtles and for resource prioritization in the region, to strategically protect turtle populations from climate change.

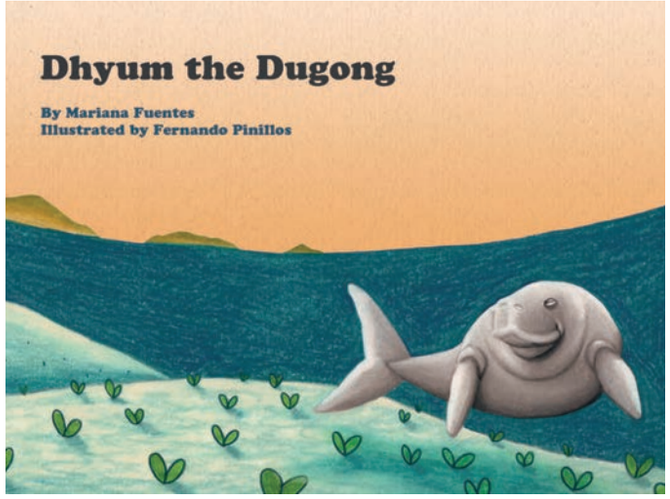
Currently, Mariana is undertaking a postdoctoral fellowship at the ARC Center of Excellence for Coral Reef Studies, where she is developing a systematic framework to help identify priorities for the management of marine megafauna, to increase their resilience to climate

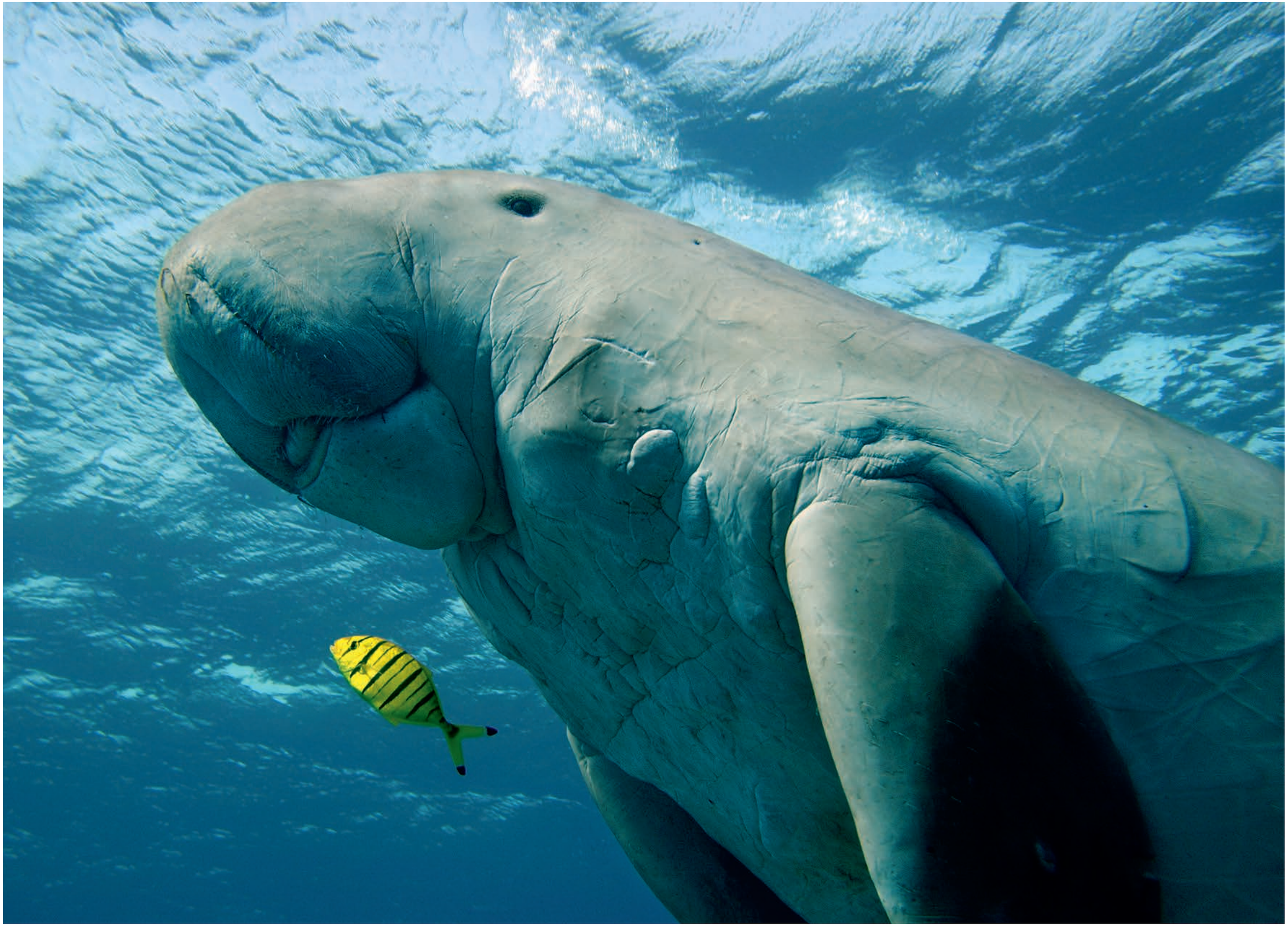
change. Financial support for the management of marine mega-fauna is often limited; thus managers need to prioritize the allocation of their limited funds cost-efficiently, to achieve the best conservation return. However, there is a lack of explicit methods to aid the prioritization of resources, taking costs, probability of success, uncertainties and benefits of various management strategies jnto consideration. This is the case with the management of sea turtles and dugongs in the northern Great Barrier Reef (nGBR) and Torres Strait region. The globally significant populations of sea turtles and dugongs in this region face several threats from anthropogenic activities and future climate change.

For logistical, financial and political reasons, natural resource agencies cannot address all of these drivers or "threats" simultaneously; priorities must be established. Consequently, there is an urgent need for a systematic decision-theory framework that accounts for the benefits and costs of actions while incorporating the complex effects of climate change. Therefore, Mariana's current research is designed to provide key information to agencies to help them prioritize the allocation of limited conservation funds, to achieve their management goals cost-effectively.

A key aspect of her project is not only to engage with regional stakeholders who are involved in the management of turtles and dugongs in the region, but also to educate and build the capacity of local communities to better manage their own resources and make informed decisions in the future. To achieve this, a series of activities are being undertaken, from engagements with managers and local rangers to visiting local schools and educating the general public.

Funding from Save Our Seas Foundation has assisted Mariana to liaise with regional managers. They discuss the effectiveness and opportune moments of various management strategies for marine turtles and dugongs in the region. Additionally, funding received from Save Our Sea Foundation was used to develop an educational book on dugongs. "Dhyum the Dugong" was written to educate children about the importance of conserving dugongs. The main character of the book, Dhyum, is based on a real animal that was satellite tagged at Mabuiag Island in 2010 and named by the local children. The book aims to educate Torres Strait children about the perils faced by dugongs and what these challenges mean to the Torres Strait communities. The book has been distributed in North Queensland and is being used as part of the school's main curriculum in Torres Strait.





THE TURTLE DIARIES PROJECT

Project Leaders: Rita Banerji and Maya Khosla

Filming olive ridleys first drew Rita Banerji into the world of sea turtles in 2006. She and her team at Dusty Foot Productions (New Delhi, India) created "The Right to Survive", a film balanced between sea turtle natural history, fisheries livelihood issues and conservation challenges. The film served as a discussion platform for scientists, local non-profit organizations, fishermen and Forest Department officials based in India's east coast state of Orissa. Rita believes films have the potential to foster dialogue and transform perceptions.

The penultimate scene in "The Right to Survive" inspired Maya Khosla to work on the Turtle Diaries Project. A biologist and writer based in California, she was riveted by the sight of women and children from a remote village racing across a beach, their arms loaded with bucketfuls of disoriented sea turtle hatchlings. The hatchlings were then carefully released in the sand, along a line parallel to the oncoming waves.

The Turtle Diaries Project team aims to educate coastal communities and the greater public about the sea turtles of India, using media tools including film and writing. A powerful knowledge base can galvanize further action —that is the main aspiration.

The Project

Putting the Indian coast on the world's map of long-term research and community-based conservation is an integral part of the Turtle Diaries Project. Starting in September 2011, the team embarked on a series of journeys documenting sea turtle natural history, research and conservation work across India's beaches and waters, which support four sea turtle species. All of them are on the IUCN Red List of Threatened Species: leatherbacks (Endangered), olive ridley turtles (Vulnerable), green turtles (Endangered) and hawksbills (Endangered).

The Turtle Diaries Project team picked four far-flung regions for their work, two in the west (the west coast state of Gujarat and the Lakshadweep Islands) and two in the east (the east coast state of Orissa and the Andaman and Nicobar Islands), to represent a cross-section of the marine and coastal habitats frequented by India's turtle populations.

October 2011 marked the beginning of the green sea turtle nesting season in Gujarat. The team travelled there with Ema Fatima, a researcher from the Indian Institute of Science, who trained community members in monitoring and standard operating protocols for sea turtle hatcheries. The Turtle Diaries Project team accompanied the Prakruti Nature Club field crews and the Forest Department staff who were monitoring green sea turtle nests. They documented the night-walks across miles of beach. Later in the season, the team returned to record the emergence and release of hatchlings from the Madhavpur hatchery. Dur-

ing that time, the Prakruti Nature Club founders, Dinesh Goswami and Jignesh Gohil, jumped at the opportunity to save two whale sharks, which was also documented.

In December 2011 and January 2012, the Turtle Diaries team joined the Andaman Nicobar Environmental Team in South Andaman Island. They were ferried across the Andaman Sea to Little Andaman Island to document work at the leatherback camp, run by members of the local Karen community. The Karen were trained in tagging and monitoring leatherbacks by Kartik Shanker and Naveen Namboothri of the Indian Institute of Science and by Adhith Swaminathan. Many of the night beach walks were graced by the sight of these soft-shelled giants, the leatherbacks, rising from the Indian Ocean and clambering ashore.

Fortunately, the sea turtle nesting season varies from one geographical area to another.
Not too long after the team was done with their Andaman Islands work, there was a shift in the offshore winds blowing towards the east coast state of Orissa, and thus a signal: the arribada (mass nesting) was about to begin. On the last days of February 2012, the team travelled to a sandbar island on the mouth of the Rushikulya River to join researchers Sajan John, Murali Dharan, Ema Fatima and Amrit Kumar Mishra (all affiliated to the Indian Institute of Science), who were working with the Forest Department staff, to monitor and establish a count of nesting olive ridley females. Some 80,000 olive ridleys crawled ashore to nest and lay eggs. Members of the Rushikulya Sea Turtle Protection Committee were also active, surveying the mass nesting of olive ridleys in Podampeta Village. The hatchlings emerged in April 2012. Researchers returned to test batches of hatchlings for disorientation by means of lights and for the potential impacts of climate change.

Reports from the Turtle Diaries project are increasing local and global awareness about sea turtle natural history, and monitoring and conservation practices in India. Work on the Lakshadweep Islands is planned for the winter of 2012. On Lakshadweep, Rohan Arthur and Aparna Lal are among the researchers who are documenting the recovery of coral reefs after the 1998 El Nino event, and the conflicts between fishing communities and green sea turtles.

The Turtle Diaries Project could not have come into being and could not continue without the maintained support from the Save Our Seas Foundation.

Red and yellow plankton, collected during this project

PROJECT IN FOCUS

MONITORING JUVENILE WHALE SHARKS IN THE GULF OF TADJOURA, DJIBOUTI

Project Leader: David Rowat

David has long been associated with whale sharks and the Seychelles, his home for over 29 years - so why the attraction to the little North African state of Djibouti? Ever since being invited there to help document the annual aggregation of juvenile whale sharks, David has realized that this aggregation is very special and may hold the key to some of the long-standing mysteries about this species, the largest of all sharks.

Michel Vely, a vet and marine mammal specialist, had communicated with David for some time about humpback whales in the Indian Ocean. When Michel moved to Djibouti, he discovered that large numbers of whale sharks were regularly found there each year and, knowing that the species was David's passion, he asked what investigations should be undertaken. The pair quickly initiated marker tagging studies and, with considerable help from Michel and colleagues in Djibouti, David and several others were able to visit the country to see the aggregation first-hand in January 2006. Like almost all known whale shark aggregations, this was comprised of juveniles, but whereas in most places these juveniles have an average size of 5-7 meters, here they were smaller – much, much smaller... in fact the average size was only 4.5 m, with the largest being 6 m and the smallest only 2.5 m. This was a very different type of aggregation!

The initial research trip recorded 127 encounters in just five days, with photo-identifications indicating that there were at least 23 individual sharks. A satellite tag deployed during the trip detached after only a few days, but showed that the shark had traversed the Gulf of Tadjoura three times during that period, making dives to depths of 200 m. There was obviously potential for a great deal of research to be done on this aggregation!

In 2010, with support from the Save Our Seas Foundation, David was able to return with a team from his Seychelles program and spent two five day periods undertaking dedicated surveys. As before, the number of sharks was not just impressive, but overwhelming! A total of 826 encounters were recorded over the ten days and 186 sharks were photo-identified; nothing like this had ever been recorded before. Similar to the initial visit, the average size was found to be just under 4 m long, with the largest individual seen being 6.5 m and the smallest 2.5 m.

What was happening here? Why were all these very small whale sharks in such a confined area? The answers probably lie in the geographical make-up and topography of the area. The Gulf of Tadjoura is a small dead-end inlet into the north east corner of Africa, formed by the rift between the African and Arabian continental plates (the rift continues inland as the East African Rift Valley). Inside the Gulf, the wind funnels over a steeply upward-shelving seabed, creating currents that concentrate plankton in the closed end of the inlet and make it an ideal area for young whale sharks to feed. Environmental studies during the 2009 expedition showed that sea temperatures were almost constant from the surface down to depths of 76 meters, a balmy 26.5°C, but plankton analyses showed a very patchy distribution; some areas yielded almost 13 grams per cubic meter – a massive density, four times greater than the maximum on other days. Satellite tagging studies during this expedition also showed that as the sharks left the Gulf, much deeper dives were made, to depths in excess of 800 m.

The Save Our Seas Foundation has supported David and his team's work on this fascinating aggregation for the last three years, enabling them to build a very solid data set. The Foundation's support has enabled over 3,160 encounters to be recorded, identifying over 330 individual sharks, many of which were seen over multiple years. These data form the basis of a major paper, currently in preparation, which will unravel some of the mysteries of this aggregation and further the understanding of, the world's largest but still poorly understood, shark.

Tagging a whale shark

A plankton net

PROJECT IN FOCUS

SAWFISH CONSERVATION PLAN

Project Leader: Lucy Harrison

Lucy first ventured under the water at the age of 12, when her father needed a scuba diving partner. The ocean realm grabbed her attention during that first dive and hasn't let go! From the cold waters of the UK and Canada, to the warm waters of the Central Pacific and the Caribbean, Lucy has asked questions about the effectiveness of chemical defenses in sponges, the size structure of abalone populations, the optimum size of marine protected areas and the effects of human-derived estrogens on sex-changing fish. Although many people grow up consumed by the thought of sharks, Lucy only recently took the plunge into this world, but her diversity of experiences in the field of marine biology has allowed her to apply this knowledge effectively to shark conservation and management. Over the past three years, working for the IUCN Shark Specialist Group, Lucy has been involved in many aspects of sharks, from the foundation of taxonomy, the creation of Red List Assessments of sharks, the science behind shark fishing, attending high-level policy meetings on the management of sharks, to, finally, communicating all of this information to the various stakeholders interested in sharks.

Sawfishes are magnificent, weird and wonderful creatures of myths and legends. They can reach a staggering 7 m in length, have a large toothed 'saw' that makes up nearly a quarter of their body length and they flap their relatively small 'wings' to glide around rivers, estuaries and mangroves looking for food. When they locate their food, they stun it from the water column with the full force of their massive saw.

It seems that sawfishes were once dominant members of coastal ecosystems of 80 tropical and sub-tropical countries. Because of this, sawfishes pervade folklore and traditional stories, even in places where they no longer exist.

Sadly, sawfishes are now only present in perhaps 40 of these countries, probably less. But why? How could animals that had been revered for centuries now be locally and regionally extinct from large parts of their former range? Perhaps a hint is the fact that sawfish saws had once been used as fences in parts of Pakistan! Fisheries targeting sawfishes once existed in Lake Nicaragua, West Africa and Pakistan, but the two major present-day reasons for their demise are a combination of sawfishes being caught accidentally in nets (now occurring in the huge majority of coastal environments) and the value of their fins and saws.

But how do we prioritize the actions required to protect sawfishes, and how do we determine where to carry out these actions?

Creating Red List Assessments for all sharks and their relatives seemed a daunting task, but the IUCN Shark Specialist Group (SSG) recently completed this after over ten years of hard work. The efforts involved in this project are the key to illustrating how threatened sharks, skates, rays and chimaeras are, and which species are at greatest risk. Because of this, the IUCN SSG is now in the unique position of being able to provide global leadership and expertise in policy development and awareness-raising needed to develop Global Species Conservation Strategies and to facilitate directed conservation action for the most threatened taxa. All seven species of sawfish are Critically Endangered, thus they are ideal candidates for this type of work!

A Global Conservation Strategy for Sawfishes

The various facets of this project have been incredibly successful because of the interest and enthusiasm for sawfishes that we have encountered and generated over the past year and a half! This type of project differs from those normally supported by SOSF, hence we feel it is important to highlight the activities we have undertaken so as to inspire others to develop this type of action-oriented project, to protect species that are in the most perilous situation.

Harnessing the Enthusiasm | We have developed a Sawfish Network, consisting of over 130 members, representing more than half of the 80 countries where sawfishes were and are present. We have compiled and synthesized new knowledge from over 100 web questionnaires and 100s of documents, and have sent out seven editions of the *Sawfish Network Newsletter*, to maintain the interest and to develop collaborations between the network members. These products have been very well received.

Developing the Strategy | We have written a report that summarizes all of the available information on the status of sawfishes around the world, as well as detailing the threats faced by sawfishes and their cultural and economic value. However, most importantly, we have prioritized actions and policy recommendations to improve the conservation status of sawfishes. These were developed at a workshop held in May 2012, involving 29 participants: regional representatives, policy advisors, aquarists, scientists, and planners.

Communicating the Problem | We have created a brochure that summarizes the biology of sawfishes, the threats they face, where they are found, and it highlights a number of our conservation and management recommendations. This has been circulated widely during our awareness-raising events. We have also initiated a Sawfish Virtual Issue in *Aquatic Conservation: Marine and Freshwater Ecosystems* and have received interest in the submitted manuscript from 17 research teams. Coverage in a variety of conservation and scientific blogs has ensured that we have communicated the plight of sawfishes to a large and varied audience.

Raising the Profile | As a direct result of the high profile generated by this SOSF-funded project, the Global Sawfish Conservation Strategy was featured as a flagship case study by the IUCN SSC Sub-Committee for Species Conservation Planning at an IUCN SSC meeting (Abu Dhabi, February 2012) and at the IUCN World Conservation Congress (WCC; Korea, September 2012). Further awareness-raising activities have occurred through side events and presentations at the WCC, the United Nations Food and Agriculture Organization Committee on Fisheries, and the American Elasmobranch Society annual meeting.

Nick Dulvy (IUCN Shark Specialsit Group) and Lucy Harrison

Implementing the Strategy | We have already begun work on implementing parts of the strategy, in collaboration with members of the Sawfish Network, including the creation of an identification guide for sawfishes and a sawfish sightings network in West Africa.

Although action on the ground is key to conserving species such as the Sawfish, this action is often carried out by conservation groups working individually. Joining forces can often leverage greater support for a cause, with consequently greater attention and impact on the ground. This is what we hope to achieve through the development and implementation of the Global Sawfish Conservation Strategy.

The Save Our Seas Foundation was the first organization to support the Global Sawfish Conservation Strategy and it was absolutely critical. Without this backbone of funding, we would not have had the time to undertake the kind of relationship-building required to leverage the full budget. Additionally, core funding from such a prominent donor lends substantial credibility when we seek funds from other partners.

PROJECT IN FOCUS

GREENLAND SHARK PROJECT

Project Leader: Peter Bushnell, PhD
Indiana University South Bend

When asked about his shark repellent research, Peter is very clear about one thing; "My purpose in doing this is not to save people from sharks, but exactly the opposite; save sharks from people". Although he is a professor of biology at a university (Indiana University South Bend) 700 miles from the nearest ocean, Peter's research focuses on sharks, an interest that was sparked in 1979 when he began his Master's degree on lemon sharks at the University of Miami. Peter continues to explore the ecophysiology of sharks, with research on sandbar sharks in Virginia and Greenland sharks in Greenland.

Peter and his colleague, Dr. Rich Brill, have been interested in exploring ways to reduce the accidental death (bycatch) of over 10 million sharks per year in commercial fisheries' operations. Several years ago, Peter and Rich demonstrated that certain blends of electropositive (EP) metals were capable of interacting with the shark's electroreceptive sense and reduced the catch rates of sandbar sharks by as much as two thirds. While these studies were ongoing, Peter was also exploring the physiology of Arctic and Antarctic fishes with Dr. John Steffensen (University of Copenhagen, Denmark). Peter went to Greenland a number of times, to teach polar biology classes and conduct research and he and John became aware that Greenland sharks were a bycatch issue in the Greenland halibut fishery. It seemed only natural, then, that Peter, John and Rich combine their expertise and investigate whether EP metals could reduce the Greenland shark bycatch problem.

Greenland sharks (*Somniosus microcephalus*) are one of the few elasmobranch species inhabiting polar waters. These massive sharks are typically found in very deep water; they reach a length in excess of 7 meters, and a body mass of over 1000 kg. Greenland sharks are thought to be extremely slow growing (<1 cm per year for mid-sized animals) and, therefore, extremely long-lived (>150 years old). Females appear to reach sexual maturity at ~450 cm length, and thus could be up to 100 years old before giving birth to litters of only 7-10 shark pups.

While the size and age structure of the Greenland shark population(s) are unknown, it is well known that species with low growth and reproductive rates are easily overfished and driven into extinction. Although commercial fishing for sharks has ceased, significant numbers continue to be taken as bycatch in the Greenland longlines and trawl fisheries targeting halibut. Unfortunately, because Greenland sharks destroy significant amounts of longline gear due to their large size and voracious appetite, community governments continue to offer a bounty equivalent to $50 per shark heart, while the Norwegian government subsidizes a fishery to reduce Greenland shark numbers.

With the support of SOSF and the National Geographic Foundation, Peter, Rich and John went to western Greenland in May 2011 to test the efficacy of electropositive (EP) metals as a way to reduce Greenland shark bycatch. A number of bottom longlines were set with small, triangular pieces of electropositive metal attached just above the baited hooks. An equal number of hooks were also deployed with similar sized pieces of plastic attached above the hook, to act as a control. Over a two week period Peter and his team set over 410 hooks and caught 24 sharks, most of which were released unharmed. Unfortunately, the EP metal was ineffective at reducing shark catch rates, as equal numbers of sharks were caught on hooks with plastic pieces as with EP metal.

Peter and his colleagues also deployed four popup satellite archival tags (PSATs) to record the Greenland shark's short term movements, with the goals of developing better ways to set fishing gear to reduce shark bycatch and to increase our understanding of the shark's basic biology. PSATs are sophisticated loggers which are attached to the shark and programmed to record depth and temperature data for periods ranging from one month to one year. At the end of the time period, the tags release themselves from the shark, float to the surface, and transmit their data to satellites overhead, which then relay it to shore-side computers. All four PSATs reported in, as programmed, three months later. During those three months, all of the sharks had moved 1,000 km north to waters near Thule, Greenland, spending most of the time at a depth of 300-400 meters (probably near the bottom) and occasionally exploring trenches deeper than 1,200 meters. In September 2012, Peter and his colleagues used additional SOSF funding to deploy four more PSATs on sharks caught in a remote fjord in eastern Greenland. In an effort to gain some information on the shark's long term movements, these tags have been programmed to release themselves after 6-9 months.

Chartering boats, purchasing PSATs, replacing longline gear destroyed by sharks, shipping people and equipment to Greenland is expensive (especially in Greenland!) and none of it would have been possible without SOSF support. Due largely to the Foundation's generosity, we are beginning to assemble a better picture of "the life and times" of these large and mysterious animals about which we know very little. We hope our work will contribute to the development of management plans to protect the Greenland sharks, while still allowing native fishers to earn a living and feed their families.


DANA

PROJECT IN FOCUS

THE IMPORTANCE AND IMPACTS OF RECREATIONAL SHARK FISHING IN SOUTH AFRICA

Project Leader: Tamzyn Zweig

Tamzyn Zweig is the Programs Officer at the South African Shark Conservancy (SASC) a non-profit organization based in the coastal town of Hermanus (Western Cape, South Africa). Founded in 2007 by Managing Director Meaghen McCord, SASC is committed to ensuring the long-term sustainability of marine resources through research, education and awareness. SASC believes that to achieve realistic conservation management goals, solid partnerships between stakeholders, scientists and decision makers ensure a holistic science-based approach to marine resource management.

In 2010, the South African Shore Angling Association (SASAA) contacted the South African Shark Conservancy (SASC) because their members were alarmed that the numbers and sizes of the sharks, skates and rays they were catching and releasing appeared to be declining. South Africa's recreational fishery is comprised of organised (club members) and informal anglers who either target or accidentally catch a similar range of species (see box) as that taken by commercial shark fisheries on the same coast: the demersal shark longliners, commercial handliners and the inshore trawlers. SASC therefore began attending SASAA tournaments to tag caught and released elasmobranchs, and the project began to take shape.

Shark species taken by recreational and commercial fishers include: bronze whaler (*Carcharhinus brachyurus*), sevengill cowshark (*Notorhyncus cepedianus*), gully (*Triakis megalopterus*), ragged-tooth (*Carcharius taurus*), soupfin (*Galeorhinus galeus*) and smooth-hound (*Mustelus mustelus*) sharks.

Batoid species include: eagle ray (*Myliobatis aquila*), bull ray (*Pteromylaeus bovines*) diamond ray (*Gymnura natalensis*), spotted eagleray (*Aetobatus narinari*), honeycomb stingray (*Himantura uarnak*), biscuit skate (*Raja straeleni*) and various species of guitarfish.

A successful marine resource management plan has many facets. The information required for a holistic and integrated approach to marine resource management includes not only a sound understanding of the animals and their habitats, but also of the human nature of the fisheries that take them.

A recreational fishing survey conducted in 2007 estimated that roughly 850,000 recreational rock and surf anglers contribute approximately 2.5 billion ZAR annually to the South African economy. The proportion of the above contributed by recreational shark angling is not yet known, although a socio-economic survey designed and delivered by SASC will soon shed light on the economic importance of shark fishing in South Africa.

Recreational rock and surf club anglers accumulate points from their catches, which contribute towards their personal records and those of their club. Nearly 3,000 of these club anglers take part in over 30 catch and release competitions throughout the year, targeting several species of sharks, skates and rays. Although most club anglers practice catch and release fishing when targeting these species, growing evidence suggests that sharks and rays suffer various lethal and sub-lethal stresses during recreational catch and release angling. Post-release mortality rates are thought to be species-specific, but little is known about the cumulative effects associated with exposure to stressors such as fight time, air exposure, gear type, hook location and handling techniques. SASC therefore began attending club tournaments in 2010 in order to discover more about the impacts of recreational shark fishing. To date, a total of nearly 400 individuals from 12 species of sharks, skates and rays have been tagged with conventional spaghetti tags. Future recapture information will assist SASC in determining post-release survival rates, identifying important habitats and achieving a better understanding of population dynamics and structure. The possibility of using blood lactate level testing of caught and released sharks (to measure an indicator of capture stress) is now being investigated. Once SASC had started attending angling competitions, they began to understand more about the behaviour and attitudes of the club anglers. SASC learnt that not only do these fishers love their sport, but they are also passionately interested in and knowledgeable about the species that they target. Because anglers are so eager to contribute to scientific understanding and conservation efforts, the idea for the Responsible Angling Clinic (RAC) was born.

In September 2012, SASC piloted the first RAC in Cape Town and received positive feedback from the participants. Topics covered by the RAC included elasmobranch biology and ecology, the identification of similar species, good fishing tackle choices, hooking, landing and handling techniques and tagging methodology. A series of "confusing species" identification cards was developed for the Clinic. SASC also formed a partnership with the Ocean Research Institute (ORI), thus providing RAC participants with the opportunity to become part of the national tagging programme, and therefore important contributors to scientific studies around the country. The RAC will now be delivered to all interested clubs around South Africa and during youth development programmes administered by the South African Shore Angling Association.

The support from the Save Our Seas Foundation has made it possible for this project to spread awareness about best catch and release fishing practices to a growing number of anglers in South Africa. With the help of the Foundation, SASC has had the opportunity not only to gather valuable scientific data on a number of shark, skate and ray species, but also to develop a sustainable research program whereby stakeholders are able to contribute to scientific and conservation efforts. The resulting information is then imparted back to these anglers and will no doubt be passed on to generations to come.

EDUCATION IS THE KEY!

The importance of marine education can be summarized by the well-known quote by Baba Dioum: "In the end we will conserve only what we love, we will love only what we understand and we will understand only what we are taught".

The Foundation has a prerequisite for all grant holders: to undertake public awareness and environmental educational activities (such as giving talks and issuing press releases) as part of their project. The Save Our Seas Shark Centre in Kalk Bay, South Africa, is an educational facility that reaches around 5,000 kids each year, while 2012 brought new education projects to the Seychelles and Micronesia.

Save Our Seas Project Leader Abbie Hine has been running a **Marine Education and Awareness** project, funded by SOSF, within the Seychelles for over two years, primarily focusing on school visits. To date over 12,500 primary school children and 1,600 teachers have attended sessions coordinated in collaboration with the Ministry of Education. In addition to the school element of the project, guest talks with snorkelers and staff training are provided regularly at resorts, and there is ongoing involvement in community environmental events. The purpose of the project is to use marine education as a tool to create awareness of the marine environment, its plight, and the concept of conservation, both globally and more specifically within the Seychelles.

The project has vastly improved the level of basic marine awareness amongst teachers and

students, providing both a benchmark for the existing level of knowledge in primary schools, and also indicating the degree to which further education should be delivered. This is hugely beneficial not only for the development of the program but also as a means of informing and leading schools into the newly funded **Integrated Marine Science Education Project**, run by David Rowat of the Seychelles Marine Conservation Society and their Marine Educator, Abi March.

The Integrated Marine Science Education project is starting at secondary school level with the overall aim to develop a marine science and awareness component in the educational system in Seychelles. It will carry on through to the Polytechnic level, with the development of a vocational diploma course for marine rangers, and an optional tertiary education module in Marine Science at University level.

The Integrated Marine Science Education project kicked off very successfully this year with "The Academy by the Sea" program in Seychelles. This 'Summer Camp' is set to be an annual event and designed to encourage students to find out more about the marine world and become involved in local marine conservation projects. Approximately 36 students attended two ten-day programs this summer; the first program was for students aged between 12-14, while the second group was aged 15-16.

The valuable marine education work of both these projects in Seychelles continues to grow and develop. It is enabling the country to move towards becoming an example of how marine education can be integrated successfully into the school system, through collaboration with the Ministry of Education. It will also become a valuable part of the tourist industry and contribute to the Seychelles community as a whole.

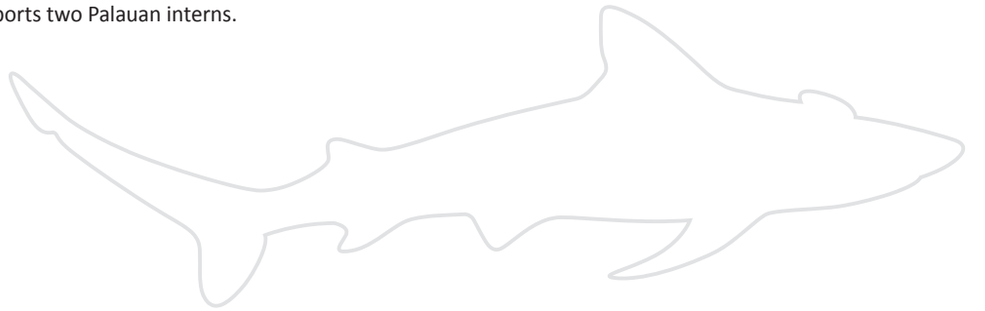
Another valuable component of the Save Our Seas efforts in the Seychelles is the **Vocational Marine Rangers Course**, which will be implemented through the Polytechnic annex of the Maritime Training Centre. The structure of the course is being guided by input from the National Parks Authority and environmental NGOs, who employ the Marine Rangers, and by the educators and Ministry administrators.

It is hoped that both of these courses will be implemented during the 2013 school year.

In Palau, Micronesia, Save Our Seas Project Leader Tova Bornovski-Harel has been running the very successful **Sharks in Schools** education program for the last two years. The idea of expanding this program to other islands of the Micronesian Region became a reality in early December 2011. The first island chosen was Yap, a state of the Federated States of Micronesia. Even though Yap is less than 300 miles from Palau, there is a vast difference between the two islands; economically, traditionally and in educational structure. The children of Yap do not get many visiting school programs, so the Sharks in Schools program was a great novelty. Yap was followed by Pohnpei, where the program was also a big success!

In collaboration with local conservation societies, the Sharks in Schools program has now reached more than 3,000 fifth-grade students across Micronesia. It has been responsible for the development and distribution of two shark education books for children and currently supports two Palauan interns.

SOSF shark education is also kicking off in Europe, in Portugal, which is one of the major shark fishing nations in the world. The **WE LIKE SHARKS** project aims to study the potential of shark watching and shark diving in this region, as well as raising shark conservation awareness among the Portuguese society. Its mission is to make the Algarve a shark friendly zone through several actions - research, education and social promotion. To accomplish this, numerous meetings have been held involving national and regional stakeholders in shark conservation, including the Portuguese Institute for Nature Conservation and Biodiversity, Port Authorities and marinas, environmental NGOs, diving centers, numerous companies and the media. Several reports have been broadcasted on prime time news on one of the foremost TV networks in Portugal (SIC), providing information about threats to sharks, like finning, and communicating the Project's messages and goals.




SAVE OUR SHARKS!


Marine Education
Seychelles
Academy by the Sea
Congratulations!

CITIZEN SCIENCE: JOIN US!

Engaging a wide audience is important in ocean conservation. In 2012, the Save Our Seas Foundation supported many projects in which members of the public played an important role.

In **Palau**, divers deliver valuable data for shark conservation by filling out surveys about shark sightings after every dive: numbers and sex (of the sharks, not the divers!), water temperature and depth. The project, executed by the Micronesian Shark Foundation, has now been running for a whole decade!

In the United Kingdom, **the Great Eggcase Hunt**, executed by the Shark Trust, is totally dependent upon public participation. In recent decades, several species of skates and rays have declined dramatically in numbers around the British coast. The empty eggcases that are washed up onto British beaches all year round are an easily accessible source of information on the whereabouts of skate and ray nursery grounds, and divers are also being encouraged to look out for eggcases on the seabed. The Shark Trust is combining underwater eggcase sightings with results from shore-based "Great Eggcase Hunts" and data from research trawls to identify nursery areas. Protecting these crucial areas from practices such as bottom trawling, dredging and spoil dumping is vital for the conservation of many shark, skate and ray species. The identification of these critical areas will enable the Shark Trust to propose conservation measures to help reverse the decline of these charismatic elasmobranchs.

Funding received from SOSF assures the continued expansion of this exciting, flagship project. With this support, the Shark Trust will build on the existing project and engage a wider audience using higher profile material and activities.

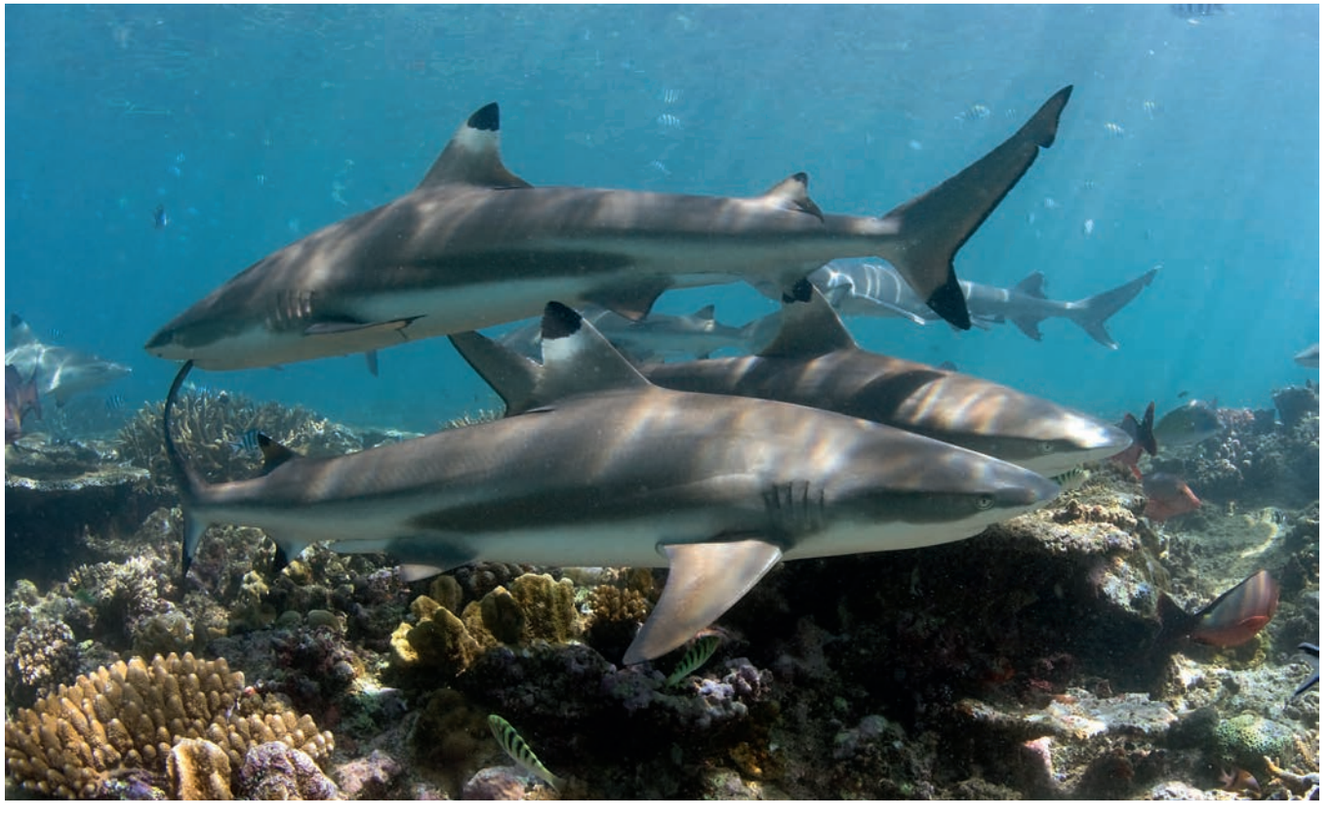
In the Mediterranean, the **Mermaid's Purse** project, executed by MedSharks, aims to gather information on the presence and breeding grounds of a poorly-known shark species and to increase awareness of sharks within the Italian diving community.

The project asks recreational scuba divers to report sightings of "mermaid's purses", the eggs of the nursehound shark (*Scyliorhinus stellaris*). Presently there are no accurate data from the Mediterranean on the population size of this species, which is classified as Near Threatened in the IUCN Red List of Threatened Species. An online questionnaire was produced and distributed to dive centers during the main Italian dive show and by email. The form was also put online and its website address is routinely advertised on the project website and Facebook page. A fact-sheet and a poster on mermaid's purses, *S. stellaris* and *S. canicula*, in Italian and English, will be provided to diving centers and made available online. This will increase knowledge on the species among the dive staff and can be used as an educational tool for their clients.

A new initiative in 2012 was the **Great Fiji Shark Count**. Fiji is currently considering the introduction of shark protection measures in its national waters. To celebrate this, and also to gather much-needed data on shark populations, diving and game fishing operations across the country are participating in the annual Great Fiji Shark Count.
During the months of April and November, every year, divers, snorkelers and fishers are asked to record all shark, ray and turtle sightings in a special logbook and to pass their observations back to be analyzed by volunteer scientists. The results will be made available to all interested parties.
A major country report will be compiled and released, to increase general awareness and to illustrate the positive outcome that participation in The Great Fiji Shark Count has had on protecting Fiji's marine ecosystems for generations ahead to enjoy.
Results are posted on the project website and spread via FijiSharkCount on Facebook, Twitter, and GPlus.
The count is an initiative of the Fiji tourism industry which led and provided event design and administration, poster, slate and log book printing, and data analysis. It was supported by several organizations including Save Our Seas.
More than 75% of all dive operators in Fiji took part in the inaugural event in April 2012, and staff and guests alike declared it a great success. The activity is fun as well as informative, and will be used as a promotion for international tourism to Fiji, to draw more attention to the existing pristine reef eco-systems in the country.
It is estimated that globally as many as 73 million sharks are killed every year, and that some shark populations have dropped by 70- 80% over the past few years. Getting real data on shark populations is vital for proper management. However, it is very hard to collect population trend data – because sharks normally spread out along the reefs in deep offshore waters; only a few are seen at any time, and normal fish counting techniques (which count numbers of fish in a measured area) cannot sight enough sharks to make realistic assessments of populations.

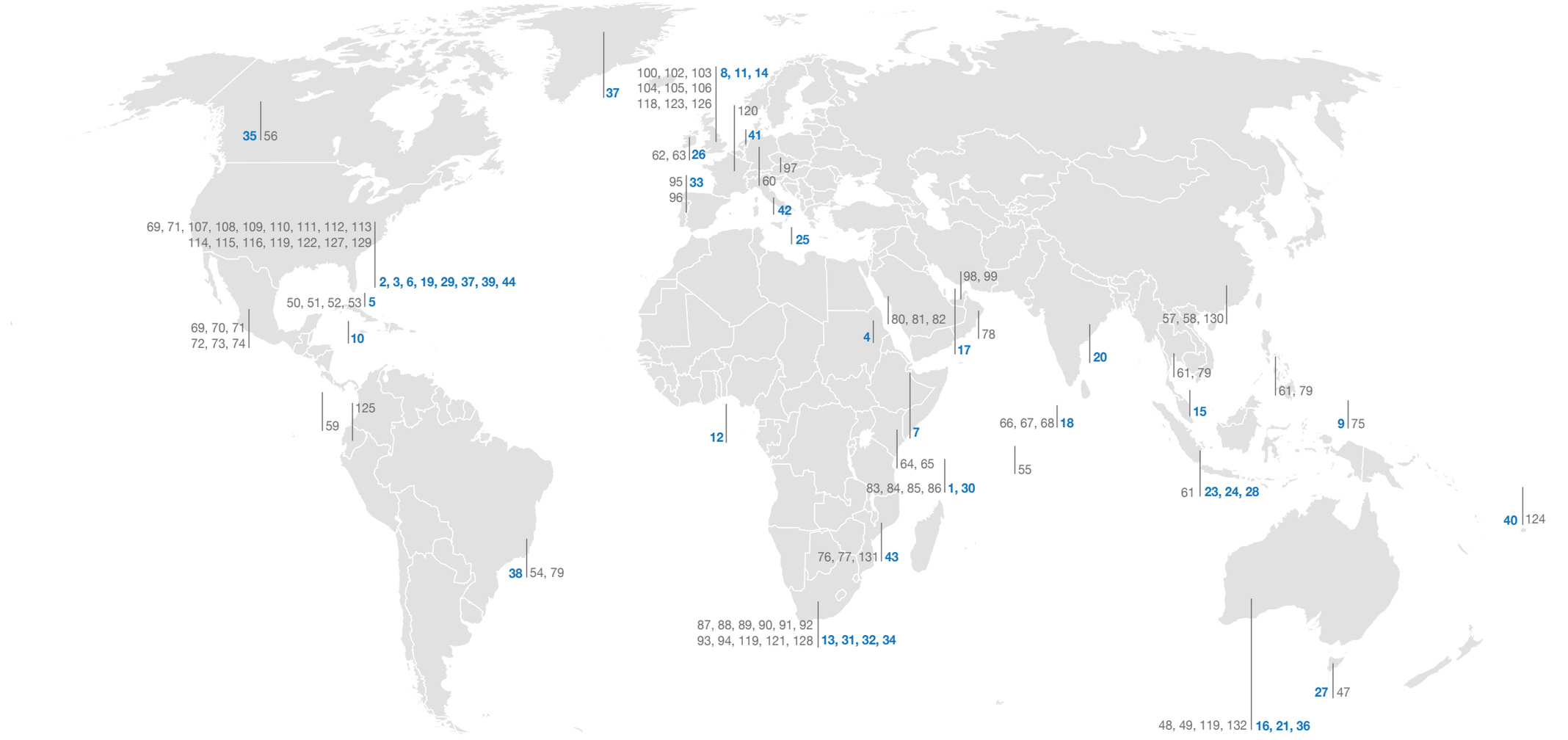
This is where "Citizen Science" comes into its own; by having many eyes on many reefs. The introduction of the **Great Fiji Shark Count** means we can collect data from hundreds of observers all across Fiji to create the first real picture of which sharks live where, and to get an idea of shark numbers. These data are important not just for Fiji, but can also supply information to global surveys.

Once Fiji has created a Shark Sanctuary, future shark counts will be used to record how successful it has been in restoring shark stocks.



Save Our Seas Foundation Projects Worldwide – Past & **Present**

Global Projects – **22,** 117, 133



PAST PROJECTS

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CURRENT PROJECTS

2012-01 (P182) Marine Education in the Seychelles
Project leader: David Rowat
Location: Seychelles

This project will develop a marine science and awareness component in the educational system in Seychelles, starting at the secondary school level and carrying on through to the polytechnic level with the development of a vocational diploma course for marine rangers.

2012-02 (P183) White Shark Genome
Project leader: Mahmood Shivji
Location: Florida, USA

This project is aimed at establishing sharks as a comparative biomedical model at the genomics level to aid in the understanding of human biology and disease, including discovery of genes that may underlie the potentially unique adaptive properties of sharks that have made them one of the oldest and most successful vertebrate lineages.

2012-03 (P184) Integrative Approaches to Shark Conservation
Project leader: Mahmood Shivji
Location: Florida, USA

SOSF continues to fund this research, which aims to answer the fundamental question of how many genetic populations of key shark species of fisheries or conservation concern there are on a global scale. This information is needed to substantially improve shark conservation efforts.

2012-04 (P185) Sudan Shark & Reef Study
Project leader: Ameer Abdullah
Location: Sudan

This continuing project forms part of the IUCN regional marine program for the Red Sea, and is aimed at determining the abundance of larger shark and ray species as well as the health and resilience of local coral reefs to climate change.

2012-05 (P186) Cognitive Abilities and Social Behavior of Giant Manta Rays
Project leader: Csilla Ari
Location: Bahamas

This project continues its focus on finding out more about the visual abilities, social behavior, learning and memory capabilities of giant manta rays, which have the largest brains of all fish.

2012-06 (P187) White Sharks (North Atlantic)
Project leader: Greg Skomal
Location: Massachusetts, USA

Although the occurrence of white sharks is well documented in the North Atlantic, little is known about its distribution and movements there. Through the use of passive acoustic telemetry, this project will shed light on fine-scale movements, habitat use, and site fidelity of this species.

2012-07 (P188) Monitoring of Juvenile Whale Sharks in Djibouti
Project leader: David Rowat
Location: Djibouti

The continuation of high intensity monitoring of this aggregation of very small juvenile whale sharks found in the Gulf of Tadjoura off Djibouti is providing key data needed to better protect this important species.

2012-08 (P189) The Great Eggcase Hunt
Project leader: Ali Hood
Location: United Kingdom

Since 2003 The Great Eggcase Hunt, a Shark Trust initiative, has been engaging the public in hunting for spent shark, skate and ray eggcases which wash up along the UK coastline throughout the year. The project was borne from concern regarding the population status of egglaying skates and rays.

2012-09 (P191) Grey Reef Sharks and Shark Education in Palau
Project leader: Tova Bornovski
Location: Palau

This project will create links among community and ecotourism groups throughout the region, raising awareness of the value and plight of grey reef sharks to promote their conservation and ensuring that they retain their place as a keystone species within reef systems.

2012-10 (P192) Cayman Islands Shark Project
Project leader: Mauvis Gore
Location: Cayman Islands

Through the investigation of reef shark movements, the effects of shark tourism, and feasibility of tracking large sharks to provide real time alerting at sensitive tourist areas, this project will assist the Cayman Islands in protecting these key components of their marine biodiversity.

2012-11 (P193) Assessing the Ecosystem Effects of Ocean Acidification
Project leader: Jason Hall-Spencer
Location: UK

SOSF continues to support ocean acidification research which studies the effects of increasingly acidic seawater by looking at sites with naturally high levels of CO_2, such as those near underwater volcanic vents.

2012-12 (P194) Conservation of the West African Manatee
Project leader: Lucy Keith
Location: West Africa

SOSF continues to fund this initiative to build a network of trained African researchers in all 21 range countries of the West African Manatee who will collect critically needed baseline data and enable grassroots conservation actions for the species and disseminate results.

2012-13 (P195) Shark Spotters
Project leader: Sarah Titley
Location: South Africa

Together with the City of Cape Town, SOSF funds a pioneering shark safety program that is proving successful and attracting local and international attention as it seeks to find a solution to potential conflicts between people and sharks.

2012-14 (P196) Joint Basking Shark Project
Project leader: Rupert Ormond
Location: Scotland

This SOSF funded project aims to build a comprehensive photographic database of UK observed basking sharks, while simultaneously using satellite tracking to observe and investigate their migratory movements into international waters.

2012-15 (P197) Sea Turtle Conservation Imperatives in Malaysia
Project leader: Nicolas Pilcher
Location: Malaysia

The purpose of this ongoing project is to conserve endangered sea turtles in Sabah, Malaysia by reducing their bycatch in shrimp trawl nets and by developing a better understanding of sex ratios and development rates of foraging populations in the wild.

2012-16 (P198) White Shark Site Fidelity
Project leader: Rachel Robbins
Location: Australia

Research on the movements of white sharks shows that while they travel extensively across their range in Australian waters, they have preferred habitat sites that they may temporarily reside in and revisit. This project aims to identify more of these key habitats in South Australian waters.

2012-17 (P199) Whale Shark Ecology
Project leader: David Robinson
Location: Arabian Gulf & Gulf of Oman

With a significant increase in whale shark sightings in the Gulf of Oman and Arabian Gulf, it is believed that this area may be of greater importance to the species than previously thought. This project investigates the ecology of local whale sharks through fieldwork and satellite tagging.

2012-18 (P200) Maldivian Manta Lifecycle
Project leader: Guy Stevens
Location: Maldives

SOSF's five year funding of detailed research has contributed to the understanding of the manta ray in this region and determining seasonal patterns and identifying critical habitats. The work has been key to the recreational diving and tourist industry in the Maldives and as a direct result, the Maldivian government has announced three new marine protected areas for mantas and whale sharks.

2012-19 (P201) Satellite Tracking Neonate Green Sea Turtles (Atlantic)
Project leader: Jeanette Wyneken
Location: Florida, USA

This SOSF-funded project is testing small solar-powered satellite tracking tags on post-hatchling sea turtles to increase our understanding of their habitat selection and offshore movements.

2012-20 (P202) Turtle Diaries
Project leader: Rita Banerji & Maya Khosla
Location: India

Four species of sea turtles breed in India's coastal habitats, and the vision for the Turtle Diaries project is to provide media tools to assist in conservation education and to empower local communities to share their knowledge and resources bases.

2012-21 (P203) Marine Megafauna
Project leader: Mariana Fuentes
Location: Australia

The goal of this ongoing SOSF-funded project is to conserve populations of dugongs and sea turtles in Australia by providing adequate tools to prioritize the management of these species in the face of climate change, as well as building monitoring capacity in the local communities that rely on these populations.

2012-22 (P204) Sawfish Conservation
Project leader: Nick Dulvy
Location: Global

This SOSF-funded initiative is developing a Sawfish Conservation Strategy, summarizing all of the available information on sawfish around the world as well as providing specific recommendations for research, education, and conservation activities relating to this species.

2012-23 (P205) Indonesian Manta Research
Project leader: Sarah Lewis
Location: Indonesia

The objective of this project is to learn more about Indonesia's manta fishery and the manta populations impacted by it, and to use this information to raise awareness about the importance of conserving mantas as well as developing a management plan for local manta populations.

2012-24 (P206) Sharks for the Future: Raja Ampat
Project leader: Naneng Setiasih
Location: Indonesia

This continuing project focuses on developing anti-shark finning campaigns to build community awareness of the issue and deepen government engagement, as well as increasing conservation knowledge of local teachers and guiding the implementation of locally-driven projects to reduce immediate threats to sharks through innovative microgrants.

2012-25 (P207) White Sharks (Mediterranean)
Project leader: Leslie Noble
Location: Mediterranean

To understand how white sharks use the Mediterranean as well as determine how isolated these populations are, this project aims to assess what, if any, mating or migratory connections they have with the Atlantic, and how environmental pollutants may be compromising their reproduction.

2012-26 (P208) Porbeagle Sharks
Project leader: Ryan Saunders
Location: Ireland

The porbeagle shark is particularly vulnerable to population depletion because of its complicated lifecycle and unsustainable fishing activities. Despite this, there are presently no robust management or conservation strategies for the porbeagle in this region, an issue this project will address.

2012-27 (P209) Conservation of Coastal Sharks
Project leader: Jayson Semmens
Location: SE Australia

With a strong emphasis on the conservation of chondrichthyans, this SOSF-funded project aims to provide optimal management strategies for a number of top order shark species present in Tasmanian coastal waters.

2012-28 (P210) Aceh-Weh Seascape
Project leader: Stuart Campbell
Location: Indonesia

SOSF funding for this project complements the ongoing MPA work in the Aceh-Weh Seascape

to reduce the impacts of unsustainable fishing practices on coral reef fishes, sharks, and rays. The area boasts critical habitats for many species which are increasingly threatened by unsustainable fishing practices and climate change.

2012-29 (P211) Building Shark Advocates International
Project leader: Sonja Fordham
Location: USA

The IUCN classifies nearly one-third of the world's 1,044 assessed shark species as Near Threatened or Threatened. Shark Advocates International addresses this by providing leadership in advancing sound shark conservation policies through collaboration with a variety of organizations and decision makers.

2012-30 (P212) Marine Education (Seychelles)
Project leader: Abbie Hine
Location: Seychelles

Marine education can be an ideal way in which to turn the tide towards improved environmental stewardship and renewing the public's feeling of ownership. This project is promoting marine education in the Seychelles, with particular focus on local coral reefs which have suffered from mass bleaching events and increasingly destructive human impacts over the years.

2012-31 (P213) Zambezi Sharks
Project leader: Meaghen McCord
Location: South Africa

Zambezi (bull) sharks discovered in the temperate Breede river estuary on the southwest coast of South Africa – more than 300 km outside of their known range – prompted SOSF to establish a funded project to identify reasons for this shift in distribution and determine the population structure in this new location.

2012-32 (P214) BRUVs in False Bay
Project leader: Colin Attwood
Location: South Africa

This project deploys Baited Remote Underwater Video Stations (BRUVS) in False Bay, providing the first comprehensive survey of fish and sharks across all habitats. The survey will directly impact the future of affordable, sustainable underwater monitoring in South Africa.

2012-33 (P215) Shark Conservation in Southern Portugal
Project leader: João Correia & Catarina Ferreira
Location: Portugal

This newly-funded project is evaluating the socio-economic value of shark ecotourism in Algarve (Portugal). Algarve shows a great potential for shark-diving and there is substantial public interest in this activity, which can be used for public education and raising awareness on shark conservation.

2012-34 (P216) South Africa's Recreational Shark Fishery
Project leader: Tamzyn Zweig
Location: South Africa

This project is quantifying organized recreational elasmobranch fishing in South Africa. Through scientific quantification of the effects of stressors species-specific post-release survival rates there is the potential of altering rules and regulations in the club angling fishery.

2012-35 (P217) Identifying Critical Habitat for Killer Whales
Project leader: Janie Wray
Location: British Columbia, Canada

Caamaño Sound, BC, is an important habitat for several species of whales. This project is enhancing our understanding of the area's importance to killer whales in a broader ecological context and adding data to the abundance estimate and spatial mapping analytical products currently being developed.

2012-36 (P218) Thresher Shark Conservation
Project leader: Charlie Huveneers
Location: Australia

A recent study using demographic analysis has shown that thresher sharks are extremely vulnerable to overexploitation. This project assesses thresher shark vulnerability to the Australian commercial and recreational fisheries through a combination of literature review, database searches, survey techniques, and tracking technology.

2012-37 (P219) Activity Patterns and Age of Greenland Sharks
Project leader: Peter Bushnell
Location: United States

Fishing pressure and a lack of knowledge of basic natural history are threats to the future of the Greenland shark, thought by some to be the longest-lived vertebrate on earth. This project deploys satellite tags and collects tissue samples for age determination in order to better understand their movements and the age structure of the population.

2012-38 (P220) Divers for Sharks
Project leader: José Palazzo
Location: Brazil

Divers for Sharks, a campaign initiated in Brazil in late 2009, is mobilizing the general public and the diving community to support shark conservation in Brazil and worldwide through its web network. Coordinated by Brazilian divers, D4S also mobilizes divers to volunteer in educational projects in schools and public events.

2012-39 (P221) Shark Angling and Release
Project leader: Betty Bauman
Location: Florida, United States

The purpose of this project is to increase awareness among anglers of why and how to release sharks, rays and other fish, and to provide educational materials documenting easy release techniques for these species.

2012-40 (P222) Shark Conservation and Awareness (Fiji)
Project leader: Alifereti Koroilavesau
Location: Fiji

Due to a lack of shark literature in Fiji, this SOSF-funded project will be made up of short-term research projects (3-4 months) focusing on shark field work, the results of which will be made available to the University community, international researchers, Fiji policy makers, students and the general public.

2012-41 (P223) A Free Tool For Identifying Individual Sea Animals
Project leader: Renate Reijns
Location: Netherlands

This project is developing a free, open source software tool to allow researchers to compare photos of individuals against a large photo database. The tool will be suitable for identifying animals without isolated spots but with specific patterns, e.g. sea turtles, goliath groupers, or the markings on whale tails.

2012-42 (P224) Mermaid's Purse
Project leader: Eleonora de Sabata
Location: Italy

This new SOSF-funded project involves recreational scuba divers to report sightings of "mermaid's purses", the eggs of the nursehound shark, and aims to provide scientists with data on the presence and distribution of breeding grounds of this species.

2012-43 (P225) Manta & Whale Shark Educational Video
Project leader: Christopher Scarffe
Location: Mozambique

Mozambique is one of the world's poorest countries with a coastline of almost 3,000 km. Most people however are wary of the sea and its inhabitants and are unaware that its resources are under threat. This film and the awareness campaign that will follow its launch aims to educate and empower communities so that they can make informed decisions.

2012-44 (P226) Tracking Oceanic Whitetip Sharks
Project leader: Demian Chapman
Location: United States

Once considered one of the most abundant apex predators in all of the world's tropical oceans, the oceanic whitetip is now listed as "critically endangered" in the western Atlantic. This project has deployed 40 satellite tags on oceanic whitetips with the aim to shed light on their migratory behavior.

CORE TEAM

Executive Director Peter Verhoog and
Georgina Wiersma (until end of 2012)
Michael Scholl (appointed as of October 1, 2012)
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Media team Christopher Neff and Stefan Kubicki
Film Producer Caroline Brett

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Credits

Front and back cover, pages 3, 5, 7, 9, 10, 13, 14, 15, 16, 20, 23, 24, 25, 39, 41, 46, 47, 48, 49, 50, 51, 61, 69, 71 top left, 71 bottom left, Peter Verhoog / 8 Wildlife Conservation Society / 17 bottom right Kate Berrisford / 19, 21 top right, 21 bottom left Nova Southeastern University / 26, 27, 29 Wildlife Conservation Society / 30, 31,32, 33 ForWhales.org / 35, 36, 37 Steve Benjamin / 38, 40 Mariana Fuentes / 43 Sumer Verma / 44 above Maya Khosla / 44 bottom Murali Dharan / 45 top left, 45 bottom left, 45 bottom right Maya Khosla / 45 top left Rita Banerji / 53 David Wachenfeld, Triggerfish Images / 55 bottom Dana Bethea, NOAA Fisheries / 55 top IUCN Shark Specialist Group / 57, 58 H. Schurmann / 63 South African Shark Conservancy / 65 left, 67 top left Abbie Hine, Wise Oceans / 65 right, 67 top right, bottom left Tova Bornovski, Micronesian Shark Foundation / 67 bottom left Marine Conservation of the Seychelles / 71 top right, bottom left Shark Trust

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Design: Maarten Radstake, Utrecht, The Netherlands
Printing: Drukwerkconsultancy, Utrecht, The Netherlands
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