On getting on with marine conservation

Whenever the Project Seahorse team discusses pressing marine conservation issues, we find ourselves returning to the same theme: the need to keep moving with conservation while maintaining scientific rigour. I’m very persuaded by the view of a wonderful colleague, the late Bob Johannes, that there is no such thing as perfect advice. The choice, in conservation as in so many things, is between imperfect advice or none at all.

Project Seahorse’s innovative and interdisciplinary approach means that we are always exploring the creative tension between action and research to develop stronger tools for marine conservation. Such integration is central to our mission. Recognizing that the pressures on marine life will continue whether or not our advice is forthcoming, I take the position that we should offer the best technical advice we can while acknowledging our areas of uncertainty. And then get on with improving our understanding through strong research.

In 2010, Project Seahorse brought its usual brand of pragmatic idealism to bear on some of the world’s most pressing marine conservation problems. As you’ll see in the pages that follow, our work covered many continents and many different issues, from the impact of shrimp trawling on small fish species in Mexico, to the movement of seahorses in Portugal, to the establishment of marine protected areas in the Philippines.

This past year, we committed ourselves to “frugal conservation” — finding new, more effective ways to do conservation without sacrificing rigour. We have, for example, found a method to detect trends in marine protected area recovery by monitoring only a small subset of all fishes on coral reefs. Our finding is highly relevant in confirming that local communities can gauge the performance of their marine reserves by monitoring only commercially important or culturally relevant species, and make effective management decisions accordingly. I encourage you to read about this and much more in the pages that follow.

I sincerely thank our donors, collaborators, and team members for their engagement and support. May we have many more happy days on and near the ocean. And may we always speak for the needs of marine life with confidence and openness.

Dr. Amanda Vincent
Director and co-Founder
Project Seahorse

Cover photo: Bargibanti’s seahorse (Hippocampus bargibanti) near Komodo, Indonesia. Guido Borgenon/Guylian Seahorses of the World 2010

Project Seahorse is an interdisciplinary and international organization committed to the conservation and sustainable use of the world’s coastal ecosystems.

Our vision is a world in which marine ecosystems are healthy and well managed.
Our work:

Saving seahorses

Seahorses are flagship marine species, charismatic symbols of the seagrasses, mangroves, coral reefs, estuaries and seaweeds where they make their homes. They are important predators on bottom-dwelling organisms; removing them can disrupt ecosystems. Their unusual life history — only the male becomes pregnant and pairs are monogamous in many species — offers an opportunity to increase our understanding of reproductive ecology.

Project Seahorse pioneered the study of seahorses in the wild and continues to expand the body of scientific knowledge about their biology, life history, taxonomy, trade, and threats. Because these fascinating animals suffer from the same pressures and benefit from many of the same interventions as other marine life, our work to understand and protect them supports marine conservation more broadly.
Every night, local fishers paddle their tiny outrigger boats over the Danajon Bank, a rare double barrier reef system in the central Philippines, and, with only the glow of a lantern to illuminate their way, slip into the black water in search of seahorses and other small fishes. If they’re lucky, a night’s work will yield a single seahorse among their catch, which they will sell to traders.

It wasn’t always this way.

“The older guys told me that in the 1970s they would catch a hundred seahorses in a night, sometimes more. It seemed like an unbelievable number,” says Kerrie O’Donnell, a PhD student with Project Seahorse, of her interviews with long-time lantern fishers.

As part of her research, O’Donnell interviewed the fishers about the species and volume of seahorses they caught in the 1970s and 80s. Using their recollections and extrapolating from existing data, she recreated a history of seahorse fishing on Danajon Bank. She wanted to understand how these populations changed between the 1970s and 1996, when Project Seahorse first began tracking seahorses there.

“To truly understand the situation right now, to understand the threats to seahorses and to identify solutions, we need to know what was happening ten, twenty, thirty years ago,” she says. “In many areas of the world, we don’t have baseline data for seahorses or most other fisheries, so it’s difficult to know how much fish populations have declined in recent decades.”

In order to reconstruct these historical fisheries, O’Donnell needed to account for the vagaries of memory. ‘Wishful thinking’ and other factors can influence how fishers remember their catches in the distant past. Using existing interviews, logbooks, catch rates from 1997 and later, she developed a novel methodology that allowed her to adjust the older historical data for accuracy.

Today, small-scale fishers in the Philippines and other developing countries contribute to the global wild seahorse trade, which totals over 25 million animals per year. The seahorses they catch and sell — for about $0.40 each — end up on display in aquariums, as dried specimens in traditional Chinese medicine, and as curio souvenirs for tourists around the world.

“By comparing Project Seahorse data from the past fifteen years with the information we gleaned from the fishers about the more distant past,” says O’Donnell, “we can better gauge the current rate of population decline and adapt our conservation work accordingly. Of course, memory is a fragile thing, so we needed to adjust for bias.”

A lack of historical data hinders conservation efforts for many threatened marine species around the world. O’Donnell’s new methodology will help conservationists to retrieve this vital information from the past accurately and effectively.

You can learn more about this research in “How does the accuracy of fisher knowledge affect seahorse conservation status?” and “Improving conservation and fishery assessments with local knowledge: future directions.” Both papers are available at www.projectseahorse.org/research.

IUCN Red List

The IUCN has designated Project Seahorse to be the authority on extinction risks for seahorses, seadragons, pipefishes, sticklebacks, and related fish species. In 2010 we assessed six seahorse species, three of them newly identified. We determined that Syngnathus watermeyeri, a species of pipefish endemic to South African estuaries, is critically endangered. Our Red List assessments will inform conservation decision-making about these and other seahorses, pipefishes and their relatives.

Oil spill media advocacy

One of the critical issues overlooked in the early media coverage of last year’s oil spill in the Gulf of Mexico was its effect on small fish species. Using the story of the iconic dwarf seahorse (H. zosterae) to illustrate the issue, Project Seahorse helped to shift the international discussion towards the effect of the spill on small and less obvious marine life. The story was picked up by media and read by over 25 million people globally, raising awareness and encouraging advocacy.
Our work:
Securing shallow seas

The first 10 metres of depth along the world’s coastlines is where seahorses and a huge diversity of other marine species live, grow and breed. These coastal ecosystems are also where human beings exert the greatest pressure on our oceans, from overfishing, sea-filling (usually known as land reclamation), and real estate development to aquaculture, land-based runoff, and pollution. Many species and habitats are threatened as a result.

We urgently need to take care of these ocean neighbourhoods, where billions of people live, swim, and fish. Project Seahorse’s innovative and interdisciplinary approach, which marries biology, ecology, social science, and advocacy, gives us distinctive insight into the problem and its possible solutions. We are using this insight — and our considerable academic credibility — to help secure our shallow seas.
Securing shallow seas
Making marine conservation more efficient

“When I tell people I do coral reef conservation, they usually tease me about the tough life I must lead, spending all that time in the sea, sun, and sand,” says Dr. Philip Molloy, a postdoctoral researcher at Project Seahorse. “If only that were true. The widely unrecognized reality about conservation is that it’s time-consuming, physically demanding and, critically, expensive.”

Dr. Molloy has been investigating new ways to make field conservation — specifically, the work of tracking changes in fish populations inside marine protected areas (MPAs) — more time-efficient and cost-effective.

Achieving the right balance between scientific rigour and action is one of the great challenges in marine conservation. Our oceans, especially the first 10 metres of depth, face huge and urgent pressures, yet the work of marine conservation must be done carefully and accurately. Without accurate studies about the impact of external pressures such as overfishing and pollution on marine ecosystems, or about the effectiveness of MPAs, we won’t be able to create better conservation tools.

By analyzing our long-running datasets, Dr. Molloy and the Project Seahorse team discovered they could obtain accurate and meaningful results for study sites on Danajon Bank in the central Philippines even if they only used data collected every other month instead of monthly. Even more importantly, their study confirmed that it is possible to detect changes in fish populations on the reefs by counting only locally fished species or those that are particularly easy to identify (such as the black-fin barracuda — a barracuda with, you guessed it, black fins), instead of all species on the reef.

“By using commonly fished species, we’ll be able to reduce the amount of time and money needed to train research volunteers — and involve local fishers in our fieldwork,” says Dr. Molloy. One of the benefits of involving local communities in conservation research is that it allows them to take a systematic look at how overfishing, physical damage and other human activities impact their fishing grounds. They also get to track how local MPAs can make fishing more sustainable in the long run by providing havens for fish populations and habitats to recover and even thrive.

“This is good news all around,” says Dr. Molloy. “Our results mean that marine conservationists will be able to work more closely with local communities to do fieldwork more efficiently – leaving more money to do more conservation, and maybe, just maybe, a little more time for that fabled sun, sea and sand.”

You can learn more about this work in “Frugal conservation: What does it take to detect changes in fish populations,” available at www.projectseahorse.org/research.

Snapshots
Here are just a few of the highlights from our work on ecosystems last year:

Investing in marine protected areas
Over the past 16 years, Project Seahorse has catalyzed the creation of 33 marine protected areas (MPA) in the central Philippines. Last year we worked with local communities to revitalize some of the oldest MPAs in the Danajon Bank region to ensure that marine animals and ecosystems can continue to replenish themselves, increasing food security in the long run. We also hatched plans for a new MPA to be launched in 2011.

Streamlining MPA planning
Successful MPAs depend on strong leadership and good management. Using the Philippines as a case study, our team developed new models to integrate MPA planning at local, national, and international levels. Integrated planning means better-run and ultimately more effective marine reserves.
Our work:
Cleaning up fisheries

Nearly three billion people depend on the sea as a source of food and medicine, and 90% of all economic activity in our oceans takes place in coastal areas. Overfishing and harmful fishing practices such as trawling and the use of illegal fishing gear put tremendous pressure on fish populations, making their recovery increasingly difficult. We must adopt sustainable fishing practices to ensure food security for our generation and generations to come.

Using biological and socioeconomic knowledge and integrating research efforts with marine management, Project Seahorse promotes sustainable fishing practices that balance their impact on both ecosystems and human coastal communities. We develop management briefings to help governments to use their marine resources effectively and sustainably, and we work with small-scale fishers to protect fish populations and ecosystems and improve food security.
When Project Seahorse research associate Dr. Sarah Foster found herself investigating mountains of small, dead fish on the deck of a Mexican shrimp trawler in 40-degree heat, she counted herself lucky.

“No one had ever studied the impact of trawling on small fishes before,” Dr. Foster recalls of her field research. She spent eight weeks knocking on doors before developing an in-country collaboration that allowed her to get on the boats. “Studies had been done on the impact of trawl nets on dolphins and other large marine animals, but there were almost no data on how trawling affects the small species picked up as bycatch.”

In 2010, Dr. Foster completed her doctoral research on the impact of shrimp trawling on small fish species in the southern Gulf of California. Over the course of her work, which included a nine-month stint surveying catches on two different shrimp trawlers, she saw an enormous diversity of marine life pulled up in the nets.

“It was breathtaking,” Dr. Foster says. “Sometimes, there was so much bycatch you could barely see any shrimp.”

Trawling — the dragging of large nets along the seabed — is one of the most widely practiced and destructive types of fishing around the world. For every kilogram of shrimp picked up in the nets, for example, an average of 10 kilograms of other fishes are unintentionally caught and turned into fishmeal or dumped overboard, dead or dying. The total area of seabed trawled each year is nearly 150 times the area of forest that is clearcut annually around the world.

In the past year, Dr. Foster published two papers based on her research. Her goal was to understand both the impact of the problem and the attitudes of fishers towards it.

She studied the life history of small fish species such as sand perch and stardrum and discovered that many were being caught before they reached sexual maturity. Clogged with marine life and other debris, the small mesh of the nets did not allow juvenile animals to escape, which could result in overfished populations.

Another important discovery was that while conservation-friendly fishing gear — such as turtle excluders, a sort of escape-hatch for large animals caught in the trawls — can help to address the problem, the solution is inevitably more complex.

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“Trawl fishers I interviewed received a small wage, rather than a share of the profits from the shrimp they caught. To make ends meet, they were sewing up the excluders so they could catch larger fish species along with the shrimp, the sale of which contributed to their income,” says Dr. Foster.

“What my research showed was that a host of socioeconomic factors must be addressed to make fisheries more sustainable. If the solution works for the turtle or the fish, but not the fisher, then it is no solution at all.”

Dr. Foster’s work will help to make fisheries in developing countries more sustainable. The reality, though, is that all bottom trawling exacts a terrible toll on marine life and must eventually be phased out — something that may be expedited by high energy prices or by the simple removal of government subsidies.

You can learn more about this research in “Using life-history information to assess potential effects of shrimp trawling on small fishes,” and “Tropical shrimp trawl fisheries: Fishers’ knowledge of and attitudes about a doomed fishery.” Both papers are available at www.projectseahorse.org/research.

Snapshots

Vignettes from our fisheries work last year include:

**Investigating Sri Lanka’s wild seahorse trade**

Sri Lanka is one of the world’s major exporters of live seahorses, including both wild-caught and animals bred in captivity. Most wild-caught seahorses are sourced from the by-catch of small scale fisheries in the Puttalam Lagoon area if northwestern Sri Lanka. Our researchers are investigating the supply chain and the economic, social, and ecological dynamics of the trade to ensure it is sustainable.

**Using local knowledge to improve conservation**

As part of her broader research into shrimp trawl fisheries, Dr. Foster studied fishers’ perceptions of catch rates in the Gulf of California and canvassed them for ideas about conservation in a Mexican context. The results were interesting: The fishers suggested that specially designed nets and marine protected areas were less important than education campaigns about Mexico’s dwindling marine resources. Their insights will help to improve marine conservation in the region.
Our work: Making trade sustainable

Seahorses and their relatives are valuable commodities that are traded around the world. Our novel and enterprising research has shown that more than 13 million animals — dead and alive — are traded globally each year. They are overfished for use in traditional medicines and aquarium display and as curiosities. Subsistence fishers in some nations make a substantial portion of their annual income catching seahorses, and many forms of traditional medicine use seahorses to treat a range of conditions and ailments. While seahorse fishing is generally a legitimate practice, such extraction must be kept at sustainable levels.

As a pioneering force for the protection of marine fishes of commercial importance, Project Seahorse has taken an active role in providing information to many levels of the trade network, from customs officials, to traditional medicine practitioners, to aquarists — with the ultimate goal of making it sustainable. Our investigative work informs the Convention on the International Trade in Endangered Species (CITES), an important global instrument to secure the sustainable international trade of animal and plant species.

A “kay-kay” fisher smashes coral in search of seahorses.
Jennifer Selgrath/Project Seahorse
Investigating the seahorse trade in southeast Asia

Malaysia and Thailand are important nodes in the global seahorse trade network. Until Project Seahorse’s recent investigation, however, no information was publicly available for seahorse fisheries in either country. Our team published research showing that seahorses were primarily landed as trawl bycatch in both countries, with large volumes coming out of Thailand. Our findings will inform trade controls by their governments.

Ocean Park education program

Asia was, and remains, the centre of the global trade in seahorses and related species. In addition to our CITES work in the region, Project Seahorse has partnered with organizations such as the Ocean Park Conservation Foundation in Hong Kong to educate local schoolchildren and their families about the sustainable use of seahorses and other marine species in traditional Chinese medicine.

Making trade sustainable

Understanding global trade networks

When Dr. Amanda Vincent, the co-founder and Director of Project Seahorse, recalls Project Seahorse’s early, groundbreaking investigation of the international seahorse trade, she marvels at the scope of what they found.

“We uncovered an incredibly extensive trade network across Asia, with millions of seahorses and pipefish being caught by small-scale fishers and ending up in aquariums, traditional Chinese medicine shops, and on the ends of keychains,” she says.

“As our research evolved, we realized that the trade was more widespread that we thought. There are seahorse fisheries on every continent, in Europe, Africa, Australia, everywhere but the Arctic and Antarctica. And new ones were showing up all the time.”

Project Seahorse’s efforts resulted in CITES adopting trade controls for seahorses in 2002 and implementing them in 2004. This was the first time that CITES signatory nations (currently 175 of them) had adopted such measures for any marine fishes of commercial importance, requiring guarantees that exports be sustainable. The seahorse listing set the precedent, paving the way for other such controls in the years that have followed, including shark species, sturgeon, and many more.

In 2010, Project Seahorse compiled the first-ever comprehensive historical report on the trade in seahorses and seahorse relatives in non-Asian countries before they were listed for protection under CITES.

“The goal has always been to ensure that the global trade is sustainable, rather than to eliminate it altogether,” says Dr. Vincent. “We synthesized all of the research out there and compiled it into a single tool to help the countries that have signed on to CITES to maintain their seahorse fisheries at sustainable levels.”

The report will help national and international trade authorities to gauge the pressures placed on seahorse populations by exploitation, and from this information to decide on control measures for seahorse fisheries and exports.

You can learn more about our trade work at http://www.projectseahorse.org/what-we-do/make-trade-sustainable

Snapshots

Here are just a few more glimpses from our work on trade last year:

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Our work: Training conservationists

One of major our objectives, as a collaboration-minded organization, is to equip our already formidable team members with the skills and relationships they need to do great things in conservation — at Project Seahorse and beyond. Our interdisciplinary approach to conservation brings together volunteers, graduate students, postdoctoral researchers, and professional scientists with backgrounds from anthropology to zoology and many other disciplines.

Over the years we’ve seen our team members build impressive, influential careers in conservation. In addition to their important work at Project Seahorse, they make a difference as policymakers, activists, and scientists in every region of the world.

Alumna interview
Dr. Sara Lourie

One of the world’s leading seahorse and pipefish taxonomists, Dr. Sara Lourie completed her doctoral research with Project Seahorse. Working as a research associate at McGill University’s Redpath Museum in 2010, Dr. Lourie focused on conservation biogeography and taxonomy. She maintains close ties with the Project Seahorse team as a research associate.

How did you become involved with Project Seahorse?
I knew Dr. Vincent before she founded Project Seahorse. I was an undergraduate at Oxford University and she was a postdoctoral research fellow. Following graduation and a job in Australia, I volunteered my time as an assistant in the production of a BBC film on seahorses, and then volunteered in the field in the Philippines. I continued to work with Amanda as a research assistant on my return to Oxford. One thing led to another and I ended up researching and co-authoring A Guide to the Identification of Seahorses (published in 1999).

I have seen Project Seahorse grow from initial conception to the global force for marine conservation that it is today. I am very proud of the special combination of boldness, leadership, and commitment to conservation that the team displays. Some of my best memories are of the inspirational people who have been involved in Project Seahorse at all levels. Working on the BBC film was definitely a highlight, especially being on birth-watch duty, and arranging to film inside the pouch of a pregnant male at a gynaecology unit at a Sydney hospital.
What impact has Project Seahorse made on your career?
The opportunity to work on the guide opened up the world of museums to me. Museums link present-day biodiversity with that which has gone before; support research and also have a valuable public education role. All of these are very helpful in providing the background for moving the conservation agenda forward, and I am happy to have had the chance to contribute in this arena.

Tell us about your career path, post-Project Seahorse.
Since completing my PhD I have been juggling raising a family, performing Early Music, and working as a research associate at the Redpath Museum, McGill University. Among other things I have contributed to the development of the Marine Ecoregions of the World classification (with WWF and TNC), co-written two chapters on conservation biogeography for a new textbook (recently published by Wiley-Blackwell), georeferenced amphibian and reptile specimens from across Canada (through HerpNET), connected the Redpath Museum’s collections databases to the world via the Internet, and developed and co-taught a new undergraduate course on “Science and Natural History Collections.” Seahorse research and maintaining the Project Seahorse specimen collection has remained part of my life as well.

Why are organizations like Project Seahorse important? How do they fit into the bigger picture of marine conservation?
Project Seahorse is a bold and effective catalyst in marine conservation. Straddling academia, the policy arena, and practical conservation action, it is in a unique position to capitalize on the linkages among these fields. Being relatively small, Project Seahorse and other similar organizations can be innovative, respond rapidly, and pave the way for larger conservation initiatives.

Snapshots
Here are a few updates from 2010:

Dr. Natalie Ban
Former Project Seahorse PhD student Dr. Natalie Ban is a research fellow at the Australian Research Council Centre of Excellence for Coral Reef Studies, James Cook University, Australia. She is finding new ways for marine conservation to address both ecological and social issues.

Shaun Goho
Former Project Seahorse research assistant Shaun Goho is a lecturer on Law and Staff Attorney at Harvard Law School. As an environmental advocacy lecturer and student mentor at the Emmett Environmental Law and Policy Clinic, he is doing his part to train the newest generation of conservation activists.

Boris Kwan
After working as the marine medicinal conservation officer at Project Seahorse, Boris joined Hong Kong’s Agriculture, Fisheries and Conservation Department, where he is making sure that endangered local species are protected.
Snapshots
Here are a few updates from 2010:

**Publications**

*Peer-reviewed journal articles*


*Other articles*

Vincent, ACJ. October 2010. Oil Spill increases threats to syngnathids. Species, 52: 26-27
Thank you for your support

Our partners and home institutions

The University of British Columbia’s Fisheries Centre hosts most of Project Seahorse’s international team. Project Seahorse Director Dr. Amanda Vincent is a member of the UBC faculty and holds the Canada Research Chair in Marine Conservation. www.fisheries.ubc.ca

The Zoological Society of London hosts Project Seahorse’s UK team. Project Seahorse Associate Director Heather Koldewey is the Programme Manager for ZSL’s International Marine and Freshwater Conservation Programme. www.zsl.org

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Project Seahorse scientists on a dive, Danajon Bank, Philippines.
Kerrie O’Donnell/Project Seahorse