Photo credits
Front cover: Hippocampus histrix in Sulawesi by David Harasti.

Our vision

Project Seahorse has a vision of a world in which marine ecosystems are healthy and well managed.

We are an interdisciplinary and international organisation committed to conservation and sustainable use of the world’s coastal marine ecosystems. We engage in connected research and management at scales ranging from community initiatives to international accords. Collaborating with stakeholders and partners, we use seahorses to focus our efforts in finding marine conservation solutions.

Our team

Project Seahorse is based at the University of British Columbia (Canada), in partnership with the Zoological Society of London (UK) and the John G. Shedd Aquarium (USA). The Project Seahorse Foundation for Marine Conservation (Philippines) is an integral part of Project Seahorse. This Filipino non-governmental organization focuses its work on the central island province of Bohol, specifically on a 135-kilometre-long double barrier reef called the Danajon Bank.

We also worked in collaboration with and had team members based at McGill University (Canada), Royal Holloway University of London (UK), TRAFFIC East Asia, the University of Newcastle (Australia) and the University of Tasmania (Australia).

Our major sustaining and collaborating donor was Guylian Chocolates, Belgium.

The Project Seahorse world network

Project Seahorse has offices in six countries and has connections with researchers and aquarists all over the world. Our extensive network of collaborators facilitates rapid exchange of information, ranging from seahorse and pipefish biology and ecology to broader issues of marine conservation, trade and public education.
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A CONSERVATION SCHEME

At Project Seahorse, we believe that solutions in marine conservation are most easily found by appreciating interdependencies between marine life and human communities. In our view, a hierarchy of concentric pressures bears down on individual animals, creating something of an *onion world* (see figure below).

The flow of this report follows the layers of the onion world, beginning at the centre with seahorses and working outwards through the levels of marine populations, ecosystems and fishing communities to national and global issues of trade, policy and public outreach.
DIRECTOR’S MESSAGE

This year, 2006, marked both my 20th anniversary of working with seahorses and the 10th anniversary of Project Seahorse. Thankfully, such a momentous occasion brings pride and joy, along with a sense of renewed commitment to marine conservation.

To my surprise, when I began working on seahorses in 1986, I was the first biologist to study them underwater. I spent the first six years pre-occupied with the roles of the pregnant males and their attentive female partners. Eventually though, my work led me to discover that there is a huge international trade in seahorses. My focus shifted towards the threatened status of seahorses and the launch of seahorse conservation measures. At that point I teamed up with Dr Heather Koldewey and Dr Helen Stanley from the Zoological Society of London. The pace was about to quicken.

Ever since we founded Project Seahorse in 1996, it has been considered the world’s foremost authority on the fish family (Syngnathidae) that includes 300 species of seahorse, pipefish, seadragon and pipehorse. We have produced a large proportion of the world’s research on these fishes, approved global conservation assessments (IUCN), chaired a working group for an international trade accord (CITES), provided input to the world’s definitive fish database (FishBase) and advised public aquarium and aquaculture ventures internationally.

Ten years on, Project Seahorse and our partners can take credit for a new reality: 169 countries are bound to constrain seahorse exports to sustainable levels, tens of millions of people have heard of the fragile state of seahorse populations, biological understanding of seahorses has greatly advanced and measures to conserve seahorses are emerging around the world.

True to our vision, gains for seahorses represent gains for many other marine species in the areas of multi-species management measures, marine reserves, coastal community alliances, bycatch and traditional Chinese medicine. Moreover, marine conservation has a new charismatic symbol.

As we move into another decade of energetic action to advance marine conservation, we recognise that multiple pressures bear down on marine life. Seahorses continue to provide a focus for our conservation efforts but we are now active in a whole array of fields, as this report will testify.

It will take all possible multi-faceted endeavours to reduce pressures on marine life and allow healthy marine populations to persist. We rely on our partners, donors, colleagues and friends to help in this quest. Personally, I remain as enamoured of these quirky fish and their marine environments as ever.

Amanda Vincent
TEN YEARS OF AWARDS FOR PROJECT SEAHORSE


Rolex Award for Enterprise in 1998, for empowering fishers to conserve and manage seahorses, to Amanda Vincent.

Pew Fellowship in Marine Conservation in 2000, the world’s pre-eminent accolade in this field, to Amanda Vincent.

AZA Significant Achievement Award for international conservation in 2001, to the Project Seahorse/John G. Shedd Aquarium partnership.

Award for Excellence in 2004, from the Coastal Conservation and Education Foundation (CCEF) to the Project Seahorse Foundation, for Marine Conservation.

Chevron Conservation Award in 2005, to Amanda Vincent.

Conservation Hero Award from Disney World Conservation Fund in 2006, for the alliance of subsistence fishers (KAMADA) we fostered in the Philippines.

Yves Rocher Foundation Women of the Earth in 2007, first prize awarded to Amanda Vincent.
TEN YEARS OF ACHIEVEMENT
AND DISCOVERY
Project Seahorse work, innovation and success (1996-2006)

Species biology
- Produced first seahorse identification guide (1999), which has become the core reference for seahorse conservation and management action;
- Completed the first synthesis and analysis of seahorse life history (2004);
- Made the discovery that many seahorse species form permanent faithful pairs;
- Generated the world’s first estimates of seahorse growth and survival rates in the wild.

Trade
- Exposed the global trade in seahorses with publication of landmark report (1996), estimating trade of about 24 million animals per year in 32 countries;
- Undertook further trade work (1999-2001) showing that 20 species are being traded in and among nearly 80 countries;
- Relocated more than 400 confiscated live seahorses through co-operation with UK Customs agents.

Marine fisheries
- Motivated the Queensland (Australia) government to set up a fisheries observer system to track incidental capture of syngnathids in shrimp trawls;
- Developed guidelines for Queensland shrimp trawler captains to avoid catching syngnathids;
- Reported on the trade in marine life for curiosities, leather, bioprospecting, research and teaching, aquarium use and traditional medicine;
- Collaborated with the University of British Columbia (Canada) to adopt a sustainable approach to seafood purchases;
- Published the first studies of seahorse capture in trawl fishing gear.

Engaging stakeholders
- Mentored, created and developed an alliance of small-scale fishers, KAMADA, on Danajon Bank in the Philippines, to establish marine reserves and enforce fishing laws (includes more than 800 families with chapters in 21 communities);
- Funded 33 children of Filipino fishing families to complete high school, in exchange for participating as marine conservation apprentices;
- Developed a voluntary code of conduct for seahorse imports to Hong Kong, in collaboration with traditional Chinese medicine business groups;
- Created a network of 130 researchers in 28 countries to exchange ideas on syngnathid biology and conservation.
**Marine Reserves**
- Catalysed creation of 22 no-take marine reserves in the Philippines and provided support for development of a further six reserves;
- Acquired funds for guardhouses and patrol boats for communities to enforce marine reserves in the Philippines;
- Committed to long-term research (since 1998) that has revealed measurable increases in fish numbers in no-take reserves in the Philippines.

**Conservation assessments**
- Generated the global conservation assessments for seahorse species for the IUCN Red List of Threatened Species, www.redlist.org;
- Recommended a universal minimum size limit for seahorses in international trade, now officially recommended for use in 169 countries;
- Undertook the first impact assessment of human activities on the marine environment for the entire Pacific coast of Canada.

**Aquarium collections and aquaculture**
- Co-ordinated the first workshop on husbandry, management and conservation of seahorses at the Shedd Aquarium, Chicago (1998);
- Established the European aquarium seahorse breeding programme;
- Organised the first regional collection plan for zoos and aquariums for any marine fish;
- Completed the first compilation of knowledge on seahorse husbandry in public aquariums;
- Formed a network for professional aquarists interested in syngnathids (293 members from 82 institutions in 17 countries).

**Policy support**
- Provided technical knowledge needed to establish the first controls on the international trade in marine fish of commercial importance (under CITES);
- Catalysed the first listing of marine fish in the Australian *Wildlife Protection Act*, requiring that all seahorses come from a sustainably managed source;
- Fostered EU decision to require countries to document all trade in seahorses;
- Motivated Hong Kong to require documentation for all trade in syngnathids;
- Assisted in obtaining full protection for syngnathids in four Australian states.

**Outreach**
- Published 42 peer-reviewed articles, 13 conference proceedings, 3 book chapters and policy-briefings, bulletins and articles;
- Supported exhibits at major public aquariums, reaching around 10 million visitors per year;
- Featured in six full-length TV documentaries, more than 260 news stories and 200 magazine articles internationally.

**Organisational development**
- Created the Project Seahorse Foundation for Marine Conservation (Philippines);
- Entered into formal research partnerships with 18 institutions in Canada, Asia (especially the Philippines), Europe and North America;
- Trained more than 50 volunteers in surveying marine reserves in coral reefs.

SEAHORSES

Introduction

Seahorses are powerful symbols of marine conservation challenges and provide the focus for our work. To understand the impacts of the many pressures facing seahorses, we need to understand their biology. Project Seahorse is the pre-eminent scientific authority on seahorses and we use our knowledge to develop practical conservation solutions based on excellent science. We are always mindful of how we can apply our scientific knowledge to real-world problems.

Population dynamics

Australia

In Tasmania, populations of seahorses in the Derwent River estuary have remained stable without recovering from a crash in numbers in 2002-3. Seahorse numbers in our other monitored populations in Tasmania have not changed significantly over time so we are hopeful that the problem is local.

In New South Wales, seahorse populations remain healthy at one site in Sydney Harbour where we have now tagged more than 350 big-bellied (*Hippocampus abdominalis*) and White’s seahorse (*H. whitei*). At another Sydney Harbour site, numbers of seahorses declined following removal and replacement of their artificial habitat structure (a shark net). We are working with local authorities to develop guidelines for future net replacements and have developed a new collaboration with the University of New South Wales on a project to determine the role of these artificial structures in providing food for seahorses (commencing in 2007).

Portugal

Since 2000, we have worked with a team of volunteers and research assistants in Portugal to learn about the long-snouted seahorse (*H. guttulatus*) and short-snouted seahorse (*H. hippocampus*). This year has seen publication of a study of the demography (survival, growth and movement patterns) and life history reference points (e.g., size and age at maturity and first reproduction) of the long-snouted seahorse. The analysis suggested that seahorses may recover relatively quickly from disturbances in good habitats but may be highly vulnerable to extended periods of poor reproduction. A study of long-snouted seahorse reproduction has also been accepted for publication.
In collaboration with the University of Papua New Guinea’s (PNG) Motupore Island Research Centre, we have started a new project to assess the diversity, abundance and trade of seahorses in PNG. Located at the centre of global seahorse diversity with extensive marine habitats of many types, PNG is a very important country for seahorses yet almost nothing is known about their occurrence or trade. Our technical support assisted our PNG colleagues to produce a baseline report on all historical records of seahorses in PNG, showing high diversity but little or no recorded trade. Biological assessments have identified important local seahorse habitats and we have recorded at least three known species of seahorse.

Seahorse life history

Juvenile ecology and dispersal

A key gap in our understanding of seahorse biology has been the ecology of juvenile (young and immature) seahorses. In the Philippines and Vietnam, research on the heavily-exploited tiger tail seahorse (H. comes) and hedgehog seahorse (H. spinosissimus) has given us a better understanding of the juvenile ecology of seahorses. We have found that these species disperse in open water, sometimes travelling hundreds of kilometres. When H. comes settles (after 5-10 days), it shows preference for wild seaweed beds, whereas H. spinosissimus settles (after more than 10 days) in silty habitats. Even at small sizes, H. comes show a propensity for aggregation, which may help species at low density to find mates. Our research in Portugal showed us that the long-snouted seahorse (H. guttulatus) also has an open-water phase, lasting 2-3 months, after which large juveniles settle directly into adult algal and seagrass habitat.
**Growth and longevity**

In Australia, we used data from tagged big-bellied seahorses (*H. abdominalis*) to determine the growth rate and life span for this species in the wild. A project at the University of Tasmania has shown that in Sydney Harbour these seahorses grow rapidly, mature within one year and reach maximum size in two-three years. Females are significantly larger than males and slower growing. The data suggest that populations can grow rapidly in good conditions.

**Reproduction**

We have gained a better understanding of the reproductive biology of the tiger tail seahorse (*H. comes*). Most seahorses spawn repeatedly during the reproductive season, making estimation of their total fecundity difficult. We have evaluated a statistical technique to determine mating frequency using standard underwater visual census techniques that do not require killing seahorses or engaging in costly monitoring of individual animals. The technique can be used in conjunction with estimates of brood size to estimate annual egg-production.

**Taxonomy and biogeography**

An unambiguous classification system for seahorses (i.e., taxonomy) is necessary for effective communication among researchers and conservationists. The importance of taxonomy was highlighted this year in a case-study, which described how taxonomy is important to conservation, using seahorses as an example (see case study no. 38 at www.bionet-intl.org/why). Other outputs for the year included a paper on the utility of skin fronds in identifying Mediterranean seahorses and taxonomic and identification support to numerous researchers, divers and members of the public.

We also provided tissue samples from our collection of dried syngnathids (the largest collection in the world, held at the Redpath Museum, McGill University) to the global Barcode of Life Data Systems (BOLD) project (www.barcodinglife.org). We further continued our collaboration with a working group (headed by the Nature Conservancy and World Wildlife Fund) to develop a global system of marine ecoregions, and thus hopefully to ensure the ecological representativeness of marine protected areas around the world.
**Genetics**

Genetic markers provide excellent tools for examining population structure. In 2006, we used several types of genetic marker to investigate seahorse population structure with respect to geographic features that may provide barriers to seahorse dispersal. Our sampled range now stretches from the Black Sea, through the Mediterranean and into the Atlantic Ocean and from the Canary Islands to the United Kingdom. Our work on connectivity of European seahorse populations suggested a barrier to gene flow between the Mediterranean and Atlantic Oceans, and was awarded a European Marine Research Stations Network prize.

Our work on mating systems and genetic parentage in the big-bellied seahorse (*H. abdominalis*) has been accepted for publication. Using a novel technique developed by Dr Tony Wilson (Zoological Museum, Zürich), we have demonstrated that males carry broods from a single female. This was surprising, as promiscuous courtship behaviours have been documented whereby up to six females have been observed displaying to a single male in wild Australian populations.

**Advances in research methods**

Application of conventional tags for identifying and tracking seahorses is challenging because of their reduced fins and small body size. We have now published research showing the utility of visible implant elastomer (VIE) tags in a wild population of long-snouted seahorse (*H. guttulatus*) in the Ria Formosa Lagoon, Portugal. With very high retention rates, the VIE tagging technique proved to be very effective for individually identifying more than 567 seahorses during a three year period.
ECOSYSTEMS

Introduction

Marine ecosystems are threatened by a number of human activities, including fishing and habitat degradation. Marine protected areas (MPAs) are a popular conservation tool for buffering marine ecosystems from the effects of human disturbance. No-take MPAs (reserves) are currently the most favoured strategy for recovering and managing degraded reef communities in the Philippines. Development of MPAs in the Philippines is supported by a national policy requiring local governments to protect at least 15% of municipal coastal waters. Project Seahorse is committed to MPAs as one means of conserving biodiversity and managing fisheries. We continued in 2006 to assess the effectiveness of MPAs, both in the Philippines and Canada.

Designing and implementing MPAs

New community-based MPAs

In collaboration with the regional fishers’ alliance (KAMADA) that we fostered, and with municipal governments, our Philippines team catalysed the establishment of three new community-managed, no-take MPAs and strengthened the management systems of seven existing MPAs. Management-building initiatives, in the form of training, mentoring and technical assistance, are integral to our approach. In 2006, we organised and provided training for MPA management structures, including MPA management councils, MPA enforcement teams and community-based MPA monitoring teams. Through a local grant, we helped three communities acquire equipment for enforcement and monitoring, renovate two guardhouses and build one more. We also held municipal-level feedback sessions in five towns, helping local managers to evaluate their successes and challenges.

Municipal support

We provided technical assistance to municipal governments in several ways. We assisted in drafting municipal ordinances to formalise newly created MPAs. To ensure reliable measurements of MPA boundaries, we recorded GPS coordinates and provided technical descriptions of proposed MPAs. We also adopted and promoted a standard template for the preparation of an MPA management plan and reviewed and refined a trainers’ manual for community MPA monitoring.

Community members drawing marine features in the sand as they outline a possible MPA in Busalian, Bohol, Philippines.
Photo by Amanda Vincent/Project Seahorse
Comparing community and science-based approaches

Drawing on a decade of experience with MPAs in the Philippines, we are now examining different approaches to selection of locations for MPAs on the west coast of Canada. By comparing scientific and community-driven approaches, we will be able to evaluate the conservation effectiveness of each.

Our work in British Columbia is being done in partnership with indigenous (First Nations) peoples of the region. We have a research agreement with the Gitga’at First Nation on the north coast of British Columbia, and have initiated a potential collaboration with the Huu-ay-aht First Nation in Pacific Rim National Park, on the west coast of Vancouver Island. The focus in 2006 was on the community approach to selecting areas for protection, beginning with interviews of individuals who actively harvest marine resources. This information was compiled to create maps showing the range of community preferences for potential areas for protection. Community feedback sessions with members of the Gitga’at First Nation were extremely successful. At community meetings we presented results from interviews done in 2005 and 2006, showing options for community-selected protection areas and there was much enthusiasm for protection of some of the traditionally important marine areas.

Monitoring MPAs

Seahorses

Although populations of many species of fish have been shown to increase in MPAs, others may decline in abundance because of changed relationships with predators or habitat. We would like to know how seahorses respond to MPAs so that we can offer management options to stakeholders. In the Philippines, we have used long-term data from Handumon MPA to show that the abundance of tiger-tail seahorses (H. comes) did not increase significantly in MPAs over the period 2002-2005. However, the average size of individual seahorses has increased, with expected benefits for reproductive output within the MPA and possible dispersal of young to outside the MPA.

In Australia, our associate David Harasti investigated the effects of MPAs on seahorses. He has tagged over 500 White’s seahorses (H. whitei) at sites inside and outside the Fly Point marine reserve in Nelson Bay and has conducted quarterly surveys of the population to measure movement and growth. So far, there has been no exchange of seahorses between sites inside and outside the reserve although seahorse numbers have fluctuated quite markedly over the course of the year.
Other fishes

Our long-term monitoring in five MPAs in the Philippines, published in 2006, provides us with a superb dataset with which to determine which species respond most strongly and which factors other than the MPA are most important. After extensive analysis we have demonstrated that MPAs with good enforcement have different fish communities from those with poor enforcement, despite considerable geographic variation. We have also shown that predatory species, which are a target of fishing, respond well to MPAs, that even relatively small MPAs can be effective, and that some species may fare poorly in MPAs if they benefited from overfishing of other species.

Food fish catches

This year, a food fish monitoring component was integrated into our MPA research. Piloted in fishing grounds associated with three well-established MPAs in the central Philippines, the primary objective of this study is to test whether MPAs provide benefits to local fisheries. A series of community-level consultative and orientation meetings were held before we began collecting data from the fishers.

Assessing MPA effectiveness

We took a suite of research approaches in order to assess: i) biological responses; ii) community participation and benefits; and iii) cultural values in a nested set of MPAs in the central Philippines. Throughout the studies, we trained fishers and community members to assist with social and biological research and we involved community participants in structured assessments. We also presented our findings for community and professional discussion. We introduce one study here and describe the other two in the “Communities” section.

Biological response

A long-term study on recovery of degraded coral reef communities within MPAs is tracking changes in reef fish communities. The research is determining: i) rates and magnitude of community recovery within MPAs; ii) patterns of community succession within recovering MPAs; iii) effects of MPAs on reef diversity; and iv) patterns of community interactions within MPAs.
Reef communities within MPAs have shown a statistically significant recovery, but the actual rates and magnitudes are low when compared with the needs of fisheries (for food and income) in depressed coastal fishing communities. The age of an MPA influences the recovery of fish biomass, but fish biodiversity appears to be more influenced by the location of the site. Large bodied, herbivorous fish tend to be the first to recover in terms of biomass, while carnivorous species tend to recover much later and in lower magnitude.

Data mining

Costs and benefits of MPAs have rarely been assessed rigorously. Preliminary work has begun on a new project, entitled *Mining multiple data sets for multiple no-take marine management areas (MMAs) in the Philippines*. The goal is to gain a more realistic understanding of the potential benefits of MPAs and of the circumstances that make MPAs effective conservation tools, from both socioeconomic and biological perspectives. We will perform novel assessments using our extensive, diverse and long-term data relating to no-take MPAs in the central Philippines.

Habitat monitoring

Knowledge of the habitat-needs of threatened marine species is critical for identifying management options. Decline of habitats like coral reefs is especially problematic in countries like the Philippines, where destructive fishing methods are commonly used. In 2006, we concluded two studies that assessed seahorse habitats in the Philippines, with the goal of providing information to aid management of local species. The first study involved training a team of fishers to survey wild seahorse densities in the Philippines, with the goal of providing information to aid management of local species. The first study involved training a team of fishers to survey wild seahorse densities and associated habitats in 27 sites across five provinces in the Philippines.

Results from this work confirmed that the tiger tailed seahorse (*H. comes*) is the most abundant and widespread species in the Philippines. However, seahorse densities were very low, likely due to heavy exploitation in the past. This work also identified six community-types associated with seahorses, ranging from seagrass and algae to hard coral habitats, with seahorses being most abundant on corals.

The second study characterized the seafloor composition of 28 fishing grounds in the vicinity of the Danajon Bank. Sadly, our measures of habitat quality and seahorse densities revealed some of the most degraded coral reefs in the world. Almost three quarters of the fishing grounds were covered by rubble, sand/silt and dead coral, and a significant increase in rubble over the two years of the study is suggestive of blast-fishing. Live coral cover was also very low and the poor habitat quality coincided with very low seahorse densities.
FISHERIES ASSESSMENT

Introduction

Project Seahorse’s fisheries management efforts are directed at promoting fishing practices that consider impacts on both ecosystems and human coastal communities. Finding a balance requires biological and socioeconomic knowledge and integration of research initiatives with management.

Impacts of fishing

Effects of seining (Portugal)

Non-selective fishing nets that are towed along the bottom of the ocean are usually assumed to negatively affect bottom-dwelling fishes because the nets capture fish as bycatch and simultaneously disrupt their habitats. Yet some species are able to use habitats that have been disturbed by fishing gears. With colleagues from University of Algarve, we reported the effects of seine-netting in seagrass communities on the abundance and population structure of the long-snouted seahorse (*H. guttulatus*) and short-snouted seahorse (*H. hippocampus*) in the Ria Formosa Lagoon, Portugal. The research revealed that long-snouted seahorse abundance increased when fishing with a small seine ceased, while the short-snouted seahorse declined in abundance. The difference in response was linked to differences in habitat preference: the long-snouted seahorse preferred habitats with a greater amount of vegetation, while the short-snouted seahorse preferred more open habitats with less vegetation. These results have implications for the design of MPAs.

Seahorse bycatch (Vietnam)

Some fishing practices capture large quantities of bycatch (unwanted species that are caught then discarded), with impacts on biodiversity, ecosystems and subsequent fishing. In 2006, we published the first quantitative study of seahorse bycatch in a developing country, showing that small-scale trawling in Vietnam could have a significant effect on seahorse populations. Although catch rates by individual fishers were low, large fleets working throughout the year caught hundreds of kilograms of seahorses, representing tens of thousands of individual animals. For just one fleet we studied in detail, we estimated that 32,000-64,000 seahorses were landed each year, with the catches and species varying temporally.

Bycatch in Mexico. Can you see the seahorse (*Hippocampus ingens*) at the centre of the picture?

*Photo by Sarah Foster/Project Seahorse*
Small-scale fisheries
Socioeconomics - Project Seahorse Foundation

We have begun a case-study on the social and economic significance of the seahorse fishery in two seahorse-fishing communities in Danajon Bank, Philippines. This research aims to identify economically important species, the spending patterns of households of small-scale fishers, and the effects of the local ban on the seahorse fishery on small-scale fishers in the region. A focused group discussion resulted in the identification of possible ways to tackle the intricate issues and challenges associated with balancing livelihoods and conservation.

Recovery of depleted fisheries

Traditional fisheries assessment and management techniques used in developed countries are not generally appropriate for the small-scale, multi-species fisheries typical of developing countries, where cheap and pragmatic methods are needed. We have now engaged fisher and community organisations in research to devise practical ways to recover depleted seahorse populations targeted by the lantern fishery in the Danajon Bank.
COMMUNITIES

Introduction
Marine conservation benefits greatly from the engagement of human communities who depend on marine resources and have special knowledge of ecosystem processes. This year we enhanced our commitment to people living in coastal villages in the Philippines. By helping to organise and empower local stakeholders, we generate powerful allies for sustainable management.

Supporting stakeholders
In the Philippines, we have provided training in basic leadership and management to members of a regional small-scale fishers alliance (KAMADA) that we were instrumental in founding. This group now has more than 900 member families in 21 chapters along Danajon Bank and has won global recognition for its conservation efforts. We assisted KAMADA with technical guidance in implementing its first two small projects: i) to design a better approach to municipal fishers’ registration; and ii) to establish a small-scale fishers’ conservation and management agenda for the entire Danajon Bank. We also helped ensure that KAMADA maintained a significant level of influence in MPA management in regional communities.

Women in fisheries
Project Seahorse’s interest in gender and fisheries has been piqued by changing practices in the central Philippines. As women began telling us that they were going to sea more often as resources declined, we began collaborating with Dr Leonora (Nora) Angeles, from UBC’s School of Community and Regional Planning and UBC’s Centre for Women’s and Gender Studies, on a pilot study on Danajon Bank. In our first discussions, women surprised us by insisting that they did not fish, even though we had seen them doing just that. It soon emerged that they saw their role only as helping, even when they decided where to fish, caught the fish and marketed the fish. Such lack of self- and external recognition of women’s roles in resource management will handicap efforts to achieve sustainable use.

Filipinas meet with Amanda Vincent and Nora Angeles to discuss women’s roles in fishing (Handumon village, Getafe, Bohol).
Photo by Rosemarie Apurado/Project Seahorse
Community participation and benefits of MPAs

Our research in the Philippines has contributed to a better understanding of the community’s role in managing MPAs. In a new paper reporting the results of a large-scale study of community attitudes towards MPAs, we recommend that experts consider development of long-term partnerships with communities to facilitate more realistic assessments of MPAs, particularly in terms of the choice of measures used to indicate success of MPAs. The study has yielded dividends to local people. In three communities, the mayor has committed financial support for enforcement of MPAs. The exemplary MPA monitoring documentation of the people’s organisation NAMASIN has earned them a distinction as most outstanding fisherfolk organisation in Region VII (central Philippines).

Cultural value of MPAs

We are studying the link between marine rights and the effectiveness of MPAs. Our field work in two villages in Bohol suggests that not everything labeled ‘traditional’ or ‘customary’ applies to all members of a village and that not all initiatives from outside the village work for the good of the village. However, the interaction of communities with other groups often generates creative approaches to dealing with conservation issues that are consistent with the need to improve the quality of life for people in fishing communities. The participation of villagers in fieldwork, focus-group discussions and workshops helped participants identify issues confronting their villages.
TRADE

Introduction

This year we published more of our finished work on trade in living marine resources for both food and non-food industries. These works include our findings about the live reef-fish trade, fish-leather, traditional Chinese medicines, the aquarium and aquaculture trades and the use of marine organisms for use in pharmaceuticals, education, research and testing.

Seahorses and their relatives

Global trade

We are constantly advancing our understanding of the trade in syngnathids globally, in order to support conservation and management ventures. This work has taken on new urgency now that the export of all seahorses is regulated for sustainability under CITES. In 2006, we wrote manuscripts and reports on the trade in seahorses and their relatives in east, southeast and south Asia, and are revising these for publication. The data that support these documents will also be made available through a new website we are developing to support governments charged with controlling exports of these fishes.

Australia

In 2006, we published the first analysis of the exploitation and trade of syngnathids in Australia. The very minor direct capture of seahorses for trade appears to pose no conservation threats in Australia at present, although trawling may be of concern. It has become clear, however, that Australia exports a large proportion of the world’s dried pipehorses, Solegnathus spp., which are used primarily for traditional Chinese medicine (TCM). The supply comes perhaps entirely from trawls that are targeting shrimp off Australia’s northern coasts. Australia is also the sole source of live leafy and weedy seadragons (Phycodurus eques and Phyllopteryx taeniolatus) for the live aquarium trade but numbers are low and come partly from captive rearing. Seahorse aquaculture is quite well-developed and needs to be carefully monitored for the risks it may pose to wild populations.

Aquaculture trade

In 2006, we evaluated the environmental, social and economic impacts of seahorse aquaculture, through a questionnaire distributed to 98 people/organisations involved in seahorse aquaculture in 28 countries. We also analysed the intergovernment trade databases and trade surveys conducted by Project Seahorse. We plan to publish these analyses with the documented history and current status of seahorse aquaculture in 2007.
Traditional Chinese medicine trade

We moved into a new phase of work in our collaboration with the traditional Chinese medicine community in Hong Kong. Over the past eight years, we have developed a strong and positive relationship with the Hong Kong Chinese Medicine Merchants Association with voluntary management guidelines on selective seahorse consumption and record-keeping on seahorse trade. Our members have also visited fishing villages in the Philippines, collaborated on research, offered advice about the CITES listings and advised on tolerable market adjustments.

After years of shoestring operation, we have once again hired a full-time staff person to launch new research and outreach ventures in 2007.

Aquarium trade

The aquarium trade represents a significant pressure on coral reef fish and invertebrate populations. In 2006 we began a review of all the live trade data for seahorses. In the meantime, London Zoo aquarium (our UK partner) continued to work closely with UK Customs authorities and accept live seahorse seizures.
Non-food fisheries

We have studied fisheries that exist for reasons other than nutrition since 2001 and, in 2006, published many of our findings. We evaluated the ecological and economic importance of both non-food fisheries and the live-food fish trade for a new book on the conservation of coral reefs. Reports on three types of non-food fishery were also completed and published.

Leather

We requested official government records for the United States’ trade in fish products for the period 1997-2001. From these data, we tallied the volume of fish-skin leather products and identified which fish species are mainly turned into such products. Our research resulted in a published study. Fish leather products, made from the skins of fish such as sharks, rays, eels and hagfishes and imported into the USA, were worth over US$6 million. Most of these fish were from wild sources.

Pharmaceutical development

Our work on the use of fish for the creation of new drugs and medical therapies was also published in 2006. We found that many types of sea life are collected in small numbers with the hope of discovering new drugs and medical treatments. We found that wild populations are potentially at risk when a chemical extracted from an organism cannot be copied easily in the laboratory.

Education, research and testing

We published our work on the use of fish in education, research, and testing. This work highlighted the fact that the USA and Canada, together the largest users of fish for education and research, on average use almost a half a million individual fish to teach students, conduct scientific research, test products or monitor environmental change. Nearly half of the fish used for education, research, and testing purposes were from wild sources.
POLICY

Introduction

Effective marine conservation in the field needs to be complemented by good policy initiatives in order to facilitate wide-scale change. We have been working in the policy arena with national governments, authorities and international organisations to help develop policies with positive marine conservation effects.

In recognition of the threats that trade may pose to wild populations, seahorses were listed on CITES Appendix II in May of 2004, thus requiring 169 countries to limit seahorse exports to sustainable levels. We are now developing tools to assist with implementation of this listing. We have also embarked on an exciting new initiative to support CITES authorities in major seahorse trading nations through a single web portal with information, resources and decision-support.

CITES

Minimum size limit

CITES currently endorses a Project Seahorse recommendation of a 10 cm minimum size limit for all seahorse species, with the goal of ensuring that individuals had reproduced before being collected. This proposal was a pragmatic way to regulate exports of large volumes of animals for many similar-looking species with inadequate biological information.

We have now produced an extensive report and policy-briefing, recommending a revised minimum size limit, based on more accurate information on size at maturity of seahorses in trade, which is now under consideration. Our research took us to Hong Kong, Taiwan, Los Angeles and Vancouver and involved measurement of more than 1600 seahorses.
In mid-2006 we started a new project, HippocampusInfo.org, with support from the Whitley Fund for Nature. This website will provide a central repository for seahorse data, generic resources and technical tools to support seahorse conservation by CITES signatories and other interested parties. The CITES authorities in each country are responsible for ensuring that international trade in seahorses is sustainable, but they often have limited resources and information upon which to act. We have consulted extensively with CITES authorities from the major trading nations as well as the CITES Secretariat and other interested parties. We have received very positive feedback and CITES has issued an official request that governments co-operate with this project. The site will go ‘live’ in mid 2007 and we hope that it will provide a model for other species of conservation concern.

CITES and the Philippines

While the Philippines is a signatory to CITES, which permits sustainable trade in listed species, its domestic Fisheries Code of 1998 completely prohibits trade in all CITES listed species. This default measure is penalising fishers at the same time as it precludes introduction of appropriate management measures for their fisheries, which often continue illegally. Efforts by the Project Seahorse Foundation to amend the Fisheries Code in favour of sustainable trade of seahorses and other economically-valuable marine resources have prompted proposal of a Congressional amendment to the bill, with support from fishers, non-governmental organisations and government representatives.
OUTREACH

Introduction

An essential part of our work is to engage effectively with people at many levels, from our collaborators and sponsors to our leaders and decision makers and eventually to the people of the world. Such outreach may influence international policy decisions or it may simply excite young children to learn more about marine conservation.

Collaborating with aquariums

We initiated ‘Synganthidae listserv’ as an important means of communication for public aquarium professionals working with Syngnathids. In 2006, the list grew to 293 members (9 new members) from 20 countries. The majority of the discussions are related to disease treatments, exchanges of captive-bred animals, husbandry issues and dissemination of information on seahorse-related issues.

A special exhibition held at London Zoo this year, called ‘RAW’ was seen by approximately 500,000 visitors, and gave information about Project Seahorse. Annual reports on seahorse programmes were submitted to the European Union of Aquarium Curators, the European Association of Zoos and Aquariums and the British and Irish Federation of Zoos and Aquariums. Information about Project Seahorse’s marine conservation activities, particularly those relevant to seahorses in aquariums, was disseminated through presentations at public aquarium conferences in Europe.

Project Seahorse has signed a new agreement with the Ocean Park Conservation Foundation, Hong Kong. The collaboration will seek to combine resources to further a common goal of promoting effective marine conservation programmes, including management and educational initiatives in east and southeast Asia. This builds on a long term collaboration where we have been jointly involved in animal husbandry, exhibitry, ex situ research and conservation activities.
Co-operating with researchers

Project Seahorse is committed to connecting syngnathid researchers around the world. With a membership of over 130 researchers, the Syngnathid Research Network welcomed five new members in 2006, and now connects people from 36 countries. In 2006, our reference library and citation database was expanded to include over 1100 items relating to ongoing or past research done by Project Seahorse. Electronic copies of our scholarly publications, technical reports, seahorse identification guides and husbandry manuals are all now accessible to internet users (see www.projectseahorse.org).

Sustainable seafood at UBC

Consumer-targeted campaigns are growing in popularity as a means of promoting responsible consumer behaviour. The UBC Sustainable Seafood Project is a collaboration between Project Seahorse and UBC food service providers, aimed at ensuring that all of the campus’ seafood comes from sustainable fisheries. We assessed ecological sustainability of campus seafood purchases under the Monterey Bay Aquarium’s Seafood Watch guidelines. The results of this work led to the immediate removal of four unsustainable seafood products from UBC menus (monkfish, long-line caught tuna, sevruga caviar and swordfish). We further recommended purchase of locally-caught shrimp, removal of snapper from the menu and a commitment to steelhead/trout farmed under ecologically-sound principles. In addition, our requests on behalf of UBC for more accurate seafood labelling has enabled suppliers to pass on this information to other seafood customers.

Engaging the public

Our continuing outreach initiatives enable timely dissemination of our results and provide a means for members of the public to engage with our work. PS News, our quarterly newsletter, aims to increase awareness of our latest projects, accomplishments and conservation concerns (available at www.projectseahorse.org). Our website (www.projectseahorse.org) attracts more than 7,900 visitors each month and generates many letters and emails from adults and children.

Five year old Khushi Kapoor from India is one of our youngest supporters. Khushi read about Project Seahorse on a box of Guylian chocolates and became so concerned she and her classmates raised money to send to the Philippines by selling their drawings. Photo by A. Kapoor
In 2006, our team members engaged with the public at conferences, workshops and community events and were featured in radio, television, magazine and newspaper interviews. As always, we visited a number of schools during the year, where we provided educational materials and encouraged children to learn about marine conservation. Guylian Chocolates, Belgium, one of our largest sponsors, prints a Project Seahorse marine conservation message on all boxes of their chocolates.

Writers and illustrators often approach Project Seahorse for feedback. This year, we advised the children’s authors Mara Bergman and Susan Stockdale for their latest books, *Sylvie’s Seahorse* and *Fabulous Fishes*. 

*Community involvement. 1. High school students in Handumon, a fishing village in the central Philippines, celebrate a beach cleanup with Amado Blanco (rear, right), National Director of the Project Seahorse Foundation for Marine Conservation. 2. Vancouver team members participating in the TD Canada Trust Great Canadian Shoreline Cleanup on a beach near UBC, Vancouver, Canada. Photos by Amanda Vincent/Lana Gunnlaugson/Project Seahorse*
PUBLICATIONS

Peer-reviewed journals


**Book chapters**


**Conference proceedings**


**Technical bulletins**


**Project reports**

THE TEAM

Dr Amanda Vincent  Director
Dr Heather Koldewey  Associate Director
Mr Amado Blanco  National Director (Philippines)
Dr Keith Martin-Smith  Research Fellow
Mr Jorma Neuvonen  Operations Director

Mr Jonathan Anticamara  PhD Student
Ms Rosemarie Aparado  Community Organiser
Mr Silverio Auguis  Local Community Organiser
Mr Perfecto Auxilio  Community Organiser
Ms Natalie Ban  PhD Student
Mr Wilson John Barbon  Senior Social Development Officer
Ms Jade Barnaby  Research Assistant
Ms Sarah Bartnik  Research Assistant
Mr Alfie Bartolo  Messenger
Mr Brian Cabrera  Habitat Biologist
Mr Iain Caldwell  PhD Student
Ms Shannon Charney  Operations Assistant
Dr Janelle Curtis  Research Associate
Ms Sarah Foster  PhD Student
Ms Fermina Genson  Field Biologist
Mr Eulalio Guieb III  PhD Student
Ms Lana Gunnlaugson  Administrative Assistant (from August 1st)
Mr David Harasti  Conservation Manager
Ms Lourdes Labrada  Administrative and Financial Officer
Dr Sara Lourie  Research Associate
Ms Anna Magera  Research Assistant
Dr Jean Marcus  Research Associate
Ms Sian Morgan  PhD Student
Ms Angelie Nellas  Field Biologist
Ms Kerrie O'Donnell  PhD Student
Ms Desiree Palana  Administrative and Finance Assistant
Ms Marivic Pajaro  PhD Student
Ms Hazel Panes  MPA Biologist
Ms Candace Picco  Research Assistant
Ms Heidi Schuter  Administrative Assistant (until August 1st)
Ms Jennifer Selgrath  PhD Student
Mr Geralde Sucano  Local Community Organiser
Dr Jeffrey Wielgus  Research Associate
Ms Lucy Woodall  PhD Student
COLLABORATORS

The University of Tasmania, Australia, a leading centre for temperate marine research in Australia, hosted Senior Program Manager Keith Martin-Smith.

McGill University, Canada, hosted our taxonomy expert Dr Sara Lourie and PhD student Eulalio Guieb, who is studying the link between marine rights and the effectiveness of MPAs.

Royal Holloway, UK, hosted PhD Student Lucy Woodall, who is studying population genetics, taxonomy, and parentage in two species of European seahorses.

The University of Newcastle, Australia, an innovative centre for teaching and learning, is the research base for David Harasti, who is studying marine protected areas and seahorses in New South Wales, Australia.

TRAFFIC East Asia and Project Seahorse shared responsibility for the Marine Medicinals Program, which is based in Hong Kong.

OTHER FORMAL COLLABORATORS

Centro Interdisciplinario de Ciencias Marinas del IPN (CICIMAR), Mexico
Coastal Conservation and Education Foundation Inc. (CCEF), Philippines
Fisheries for Improved Sustainable Harvest (The Fish Project), USAID, Philippines
Gitga’at First Nation (Hartley Bay Indian Band), Canada
Ocean Park Conservation Foundation, Hong Kong
PARTNERS

The University of British Columbia Fisheries Centre serves as the international base for Project Seahorse and provides administrative and logistical support. Project Director 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 coordinates our European research and aquariums network from offices at the London Zoo, where Project Associate Director Heather Koldewey is senior aquarium curator. [www.zsl.org]

The John G. Shedd Aquarium and Project Seahorse are engaged in an award-winning and innovative partnership that has supported and advanced marine conservation since 1998. This venture marries the research and field management skills of Project Seahorse with the education and husbandry excellence of Shedd, to the benefit of both. Shedd supports a variety of programs, including core operations. [www.shedd.org]

MAJOR DONORS & SPONSORS

Guylian Chocolates, Belgium: Guylian Chocolates of Belgium is a major sustaining sponsor of our research and marine conservation projects around the world. [www.guylian-choc.com]


Percy R. Gardiner Foundation: Percy R. Gardiner Foundation provides core support and funding for our research and conservation projects around the world.
DONORS

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British Airways Communities and Conservation, UK
Canon National Parks Scholars Program, USA
Columbus Zoo Conservation Fund, USA
Conservation Food and Health Foundation, USA
Conservation International, USA
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Dr. Scholl Foundation, USA
ECO Canada, Canada
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Fisheries for Improved Sustainable Harvest (The Fish Project), USAID
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Ocean Management Research Network, Canada
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Point Defiance Zoo Society, USA
Point Defiance AAZK Chapter, USA
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Toronto Zoo, Canada
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Whitley Fund for Nature, UK

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Many other individuals, agencies and organizations have contributed to our project over the years,
and are equally valued for their interest and support.
PROJECT SEAHORSE BASES

**Project Seahorse**
Fisheries Centre
2202 Main Mall
The University of British Columbia
Vancouver, BC, V6T 1Z4
Canada

Email: info@projectseahorse.org
Telephone: 1-604-827-5139
Fax: 1-604-827-5199

**Zoological Society of London**
Regent’s Park
London, NW1 4RY
United Kingdom

Email: aquarium.admin@zsl.org
Telephone: 44-207-449-6204
Fax: 44-207-483-0117

**Project Seahorse Foundation for Marine Conservation**
Project Seahorse Foundation for Marine Conservation
Gaviola Compound,
Maria Theresa Village II
Guadalupe, Cebu City 6000
Philippines

Email: foundation@projectseahorse.org.ph
Telephone/Fax: 63-32-262-8032
Telephone: 63-32-255-3599

Vancouver team members at UBC, Canada, along with senior team members from Australia, the Philippines and the UK.
Photo by Sherman Lai.