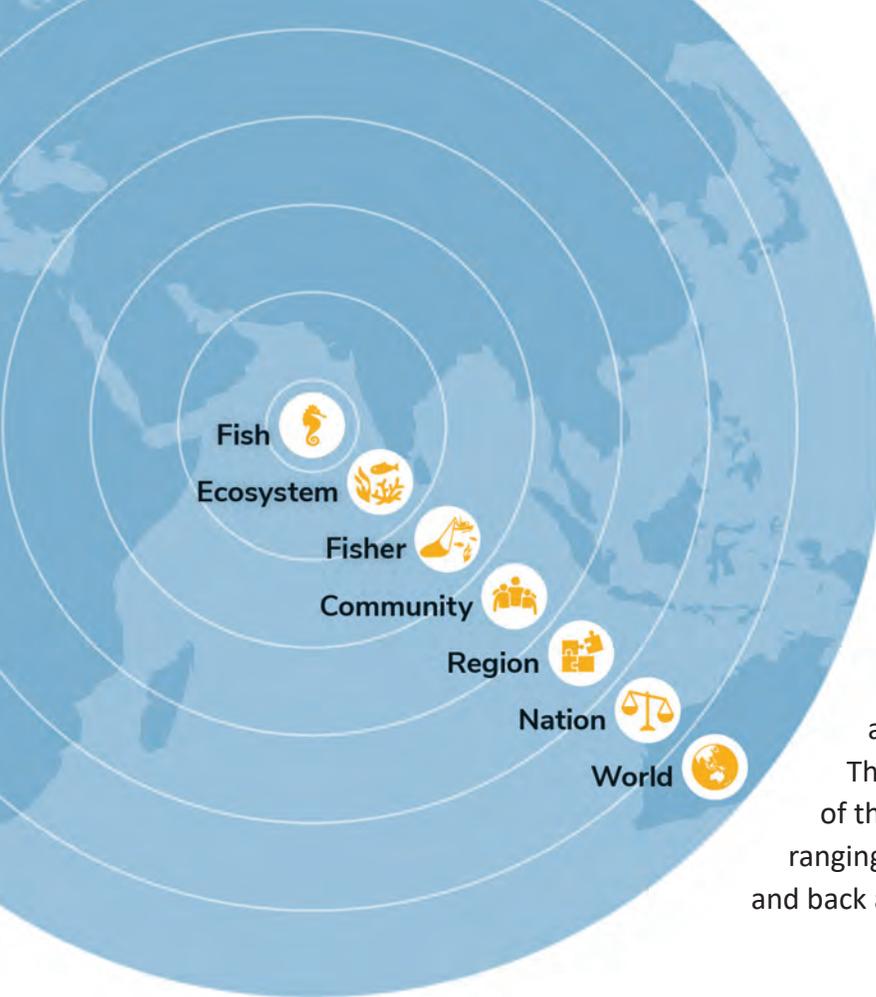


# PROJECT SEAHORSE

advancing marine conservation

## Annual Report 2021





We are leaders in marine conservation, making discoveries and collaborating globally to take effective action for seahorses and their seas.

Project Seahorse is an award-winning team that has made measurable gains in marine conservation around the world. We build knowledge and then translate it into effective action, creatively and collaboratively. When confronted with a problem, we take a multilayered approach to find solutions. This means we embrace many different ways of thinking at many spatial scales, with our work ranging from local seahorse populations to global policy and back again.

A schematic diagram of the many layers at which we engage in marine conservation research, management, and policy. Project Seahorse has made research contributions and achieved measurable outcomes in life history and ecology, marine protected areas, subsistence fisheries management, community development, national law, international trade, global policy, and public outreach. Together, these initiatives advance marine conservation.

**Our vision is a world in which marine ecosystems are healthy and well-managed.**

This vision embraces the need to reconcile conservation and human dependency on the ocean.

Our mission has three elements:

- Project Seahorse is an interdisciplinary and international organization 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 partners and communities, we use seahorses to focus our efforts in finding marine conservation solutions.

**Cover page photographs:**

Spotted seahorse, *Hippocampus kuda* (Luc Eeckhaut / Guylian Seahorses of the World)

Coral reef in the Danajon Bank, Philippines (Jennifer Selgrath / Project Seahorse)

Focus group discussion about the Marine Protected Area in Alumar, Philippines (Marivic Pajaro / Project Seahorse)

[projectseahorse.org/about-us](http://projectseahorse.org/about-us)

# Director's message

Dear friends,

Although 2021 was another unprecedented year, full of challenges, it also brought joys and opportunities. One of my greatest delights was receiving the Indianapolis Prize, the world's leading prize in animal conservation, at a marvelous gala event in September. Huge thanks to everybody involved in the award and to all of you, the amazing colleagues, collaborators, and donors who have been instrumental in our successes for the past 24 years.

In grasping the opportunities from the Indianapolis Prize, we rethought our communications messaging and created a new website. We are proud to highlight Project Seahorse as leaders in marine conservation, making discoveries & collaborating globally to take effective action for seahorses and their seas. We now group our discoveries and our actions into four categories: saving seahorses, establishing marine protected areas, limiting fisheries, and regulating trade.

During 2021, our work to save seahorses and save the seas prompted more reflection on the need to end bottom trawling, an egregious form of destructive fishing that is devastating for seahorse populations and is rapidly becoming annihilation fishing. This is where our Project Seahorse programme is so robust. First, to limit bottom trawling we play to our strengths in establishing marine protected areas and other exclusion zones. Second, by restricting bottom trawling, we increase capacity to regulate the number of seahorses in trade, one of our greatest areas of expertise.

In addition to our measurable successes in management and policy, Project Seahorse is very proud of training new colleagues in marine conservation. This year we congratulated Dr. Kyle Gillespie (Canada) and Dr. Tanvi Vaidyanathan (India) for completing their PhDs. We also welcomed five new graduate students to UBC – from Brazil, India, Spain, and the USA – to join our ongoing students from Mauritius and the UK.

Amanda receiving the Indianapolis Award at a gala in September 2021 (Chris Bergin)



All of us in Project Seahorse are proud to work with you for a better future for our world.

Prof. Amanda Vincent  
Director and Co-founder, Project Seahorse

# Where we work

Project Seahorse is a global leader in marine conservation. We are engaged in cutting-edge research and highly effective conservation action, in collaboration with governments, local communities, and other stakeholders. We are active in six continents, in a variety of ways and at varying times. Our priority is always to have national colleagues lead the work in their countries, with international cooperation and support.





Spotted seahorse, *Hippocampus kuda*  
(Bruno van Saen / Guylian Seahorses of the World)



Tanvi Vaidyanathan holding a focus group with fishers in India  
(Tanvi Vaidyanathan / Project Seahorse)



# Saving seahorses

The magic of seahorses excites great enthusiasm for marine conservation. These quirky fishes come under pressure from many and diverse fisheries and live in vitally important and threatened coastal habitats. By getting it right for seahorses – such as setting up marine protected areas, reining in bad fishing practices, and regulating wildlife trade – we support thousands of other species.

## Assessing all seahorses and their near relatives

We completed the first comprehensive assessment on the risk of extinction for all seahorses, pipefishes and their near relatives, using the definitive International Union for Conservation of Nature (IUCN) Red List of Threatened Species. These assessments help us guide conservation efforts and provide us with a baseline for a future analysis of how the conservation status of these fishes is changing.

Few marine taxa have been comprehensively assessed for their conservation status, despite heavy pressures from fishing, habitat degradation and climate change. Before 2017 only 18% of known syngnathid species had been evaluated.

Project Seahorse led a collaboration with the IUCN SSC Seahorse, Pipefish and Seadragon Specialist Group that has now evaluated all 300+ species of the order Syngnathiformes\*.

We found that 18 of the 300 species (6%) are known to be threatened with extinction, with a further 97 species (nearly a third) classified as Data Deficient. These may, in fact, be threatened and require further research to adequately assess.

Most of the species known to be threatened are seahorses (*Hippocampus* spp.: 14/42 species, with 17 Data Deficient) or freshwater pipefishes

of the genus *Microphis* (2/18 species, with seven Data Deficient). It is clear that conservation planning and action are sorely needed if we want to maintain the diversity of this order of fantastic fishes.

While threatened species occurred in most regions, the main extinction risk was concentrated in a few specific areas: in South East Asia for the seahorses (*Hippocampus* spp.), in freshwaters globally for the pipefishes (*Microphis* spp.), and in South African estuaries for some of the most threatened species (*Hippocampus capensis* and *Syngnathus watermeyerii*).

Primary threats to syngnathids are overexploitation, primarily by non-selective fisheries (such as bottom trawling), and habitat loss and degradation. Conservation actions need to eliminate or reduce these threats by curtailing non-selective fishing (ending bottom-trawling), protecting habitats, and preventing habitat loss and degradation through pollution, land-use change, and destructive fishing. These vital conservation actions for syngnathids will benefit many other aquatic species.

\* Seahorses, pipefishes, seadragons and their near relatives.

# The importance of national conservation assessments

While most conservation assessments happen at the global level, it is national governments that are mandated to act for species conservation. We thus moved from IUCN Red Listing analysis to investigating the conservation status of seahorses, pipefishes, and seadragons at the country level and documenting national regulations to protect them. Globally, 40% of the 278 species of syngnathid fishes are either Threatened (Critically Endangered, Endangered or Vulnerable) or Data Deficient on the IUCN Red List of Threatened species. National conservation assessments are more difficult to compile. Of the 140+ countries that are known to have syngnathids, we only found information on national assessments for 64 countries and with no information for over 54% of countries. Of those 64 countries, only 20% had completed national assessments for syngnathids.

In total, we were able to find 98 national conservation assessments for 52 distinct syngnathid species (16 seahorses, 34 pipefishes and 2 pipehorses). Only 34% of seahorse species had any national conservation assessments, 15% of pipefish species and 18% of pipehorse species. No national conservation assessments for seadragons were found.

Focusing on priority species considered globally as Threatened or Near Threatened, our gap analysis revealed that only 13% of countries had assessed those syngnathids at the national level. No countries in Africa, the Middle East or North America had any national assessments for the most threatened syngnathid species.

Specific regulations to protect syngnathids were found in half of the 64 countries for which we could find information, but were patchy and unpredictable with many prominent gaps. Where they existed, regulations covered either all

syngnathids, all seahorses or only a few species found within a country's waters. Very few countries had government-led monitoring of syngnathids.

We will now generate support for the IUCN World Conservation Congress Resolution 95, which calls on state and government agency members to, "by 2022, ensure that the status of syngnathids is assessed and included in national/regional Red Lists as warranted".



Kulbickii pipefish (*Fastucalex kulbickii*)  
(Richard Smith/oceanrealimages.com)



Tiger-tail seahorse (*Hippocampus comes*)  
(Kyle Gillespie / Project Seahorse)

# Establishing marine protected areas

Seahorses and other marine species need healthy marine ecosystems and good fisheries management to flourish. Marine protected areas (MPAs) remove fishing pressure and other practices that damage habitats and harm populations. By applying expertise in both biology and social work, we empower communities to establish and sustain MPAs that benefit marine life and people alike.

## The challenges of field work in 2021

The COVID-19 pandemic has changed all our lives in the last two years and its impacts and repercussions are many and far-reaching. When COVID hit, our team's first concern was, of course, our health and the health of those around us. That meant we had no choice but to defer many activities in the field, often after many years of planning and/or engagement. Much of our generation and application of knowledge takes place in countries where both seahorses and fishing communities are found, and involves a significant amount of frontline engagement with diverse people. International work was obviously problematic but domestic travel has also been hugely disrupted.

Project Seahorse is proud of its role in generating 35 marine protected areas along Danajon Bank, a double barrier reef in the central Philippines. Work to support and strengthen these MPAs has continued under ZSL Philippines, with teams of Filipino biologists and community organizers serving fishing communities in their initiatives

and aspirations. Suddenly, however, ZSL Philippines staff were hugely restricted in their travel to or around field sites, both because of the health risks of connecting people and because of the new need for inter-island travel permits. Everybody involved had to find new ways to advance conservation and maintain relationships while being flexible in coping with disruptions and respectful of very real risks.

The challenges of supporting Filipino partners and communities became bigger and more frightening in December 2021, when Typhoon Rai, known in the Philippines as Typhoon Odette, ripped through the Philippines, creating devastation. For 28 years, the people of Danajon Bank have been Project Seahorse's great allies in marine conservation. These fishing communities now urgently need support to rebuild homes and village infrastructure. We have established a GoFundMe page to help raise money for the people of Danajon Bank to get back on their feet with enough security to again dedicate attention to their marine protected areas and other vital conservation initiatives.



Guardhouse in the Magtongtong Sanctuary, Danajon Bank, Philippines (Marivic Pajaro / Project Seahorse)



Devastation in the village of Handumon after Typhoon Rai ripped through the Philippines (Rosemarie Apurado)

# Limiting fisheries

We are determined to reconcile fisheries with conservation, at all scales. While small-scale fishers collect wild seahorses by hand, the biggest threat to seahorses comes from bottom trawling. This indiscriminate gear catches thousands of species and destroys marine habitats, while also posing social and economic problems. We are now producing the research and making the connections that will help #EndBottomTrawling, in favour of selective fisheries.

## For fishers in India, the benefits of catching banned species exceed the costs

Research by Tanvi Vaidyanathan in her native India shows that there really isn't much point creating restrictions that are not – even, cannot – be enforced. While bans on capturing animals are common in conservation, their success often depends on the commitment and compliance of stakeholders. Tanvi set out to find out why a national ban on seahorse fishing and trade in India has been so ineffectual, interviewing fishers in Tamil Nadu state to understand their reasoning.

Most importantly, almost all seahorses were caught by non-selective fishing gear like dragnets and trawlers. Fishers felt that they might as well sell the seahorses, despite the ban, since the animals had already been caught and since enforcement of

the ban was so lax as to be invisible. Fishers also expressed frustration that the national ban had been imposed without consultation, given their long history of landing seahorses, so felt little sympathy with the restriction.

Economic considerations did play a role as well. These were seldom influential but owners and crew of small sail-powered dragnet boats did earn some useful money from the seahorses – their value was greater than boat operating costs – especially during times when catch of the dragnets' primary species was low. The money was enough to motivate the crew to sort the seahorses from the diverse catch when most species were just sold undifferentiated. In contrast, the crews of bottom trawlers made only recreational money from selling seahorses obtained in bycatch while the owners of bottom trawlers made no money from seahorses.

Ultimately, regulation is likely to be ineffectual if the authorities have little understanding of the fishery or the fishers. Given the challenges of banning landings and trade in incidentally caught species, conservation efforts need to focus on reducing capture in the first place, particularly through spatial restrictions on indiscriminate gear.



Trawlers in the Palk Bay region of Tamil Nadu, India, where most seahorse catches were reported  
(Tanvi Vaidyanathan / Project Seahorse)

# Managing data-poor marine invertebrate fisheries

When we talk about marine fisheries we tend to focus on fishes, but what about the other 95% of species, the squishy, colourful, fantastical invertebrates? These magical animals are under heavy fishing pressure and a critical source of protein in developing regions but we know little about their response to fisheries or their conservation status. Indeed, a critical problem is the lack of methods to assess and manage them.

Our recent PhD graduate Kyle Gillespie tackled this tricky issue during his doctoral studies. Kyle used new techniques to assess a multi-species, data-poor fishery in the Central Philippines, focusing on nine invertebrate species. In this fishery, people hand-collect marine life from the intertidal zone in a method called gleaning. Kyle trialed a new procedure for applying size-based methods that need few data, and found a tool that can help achieve higher yields and larger, more productive populations of target invertebrate species.

Kyle's analyses revealed that the invertebrate populations were being fished too heavily (at rates far higher than natural mortality) and most of the individuals extracted were below their size at first maturity; they had not even had a chance to reproduce before they were removed from the ocean. It is clear that minimum size limits that are

set carefully would greatly increase fisheries yield while also reducing pressure on populations.

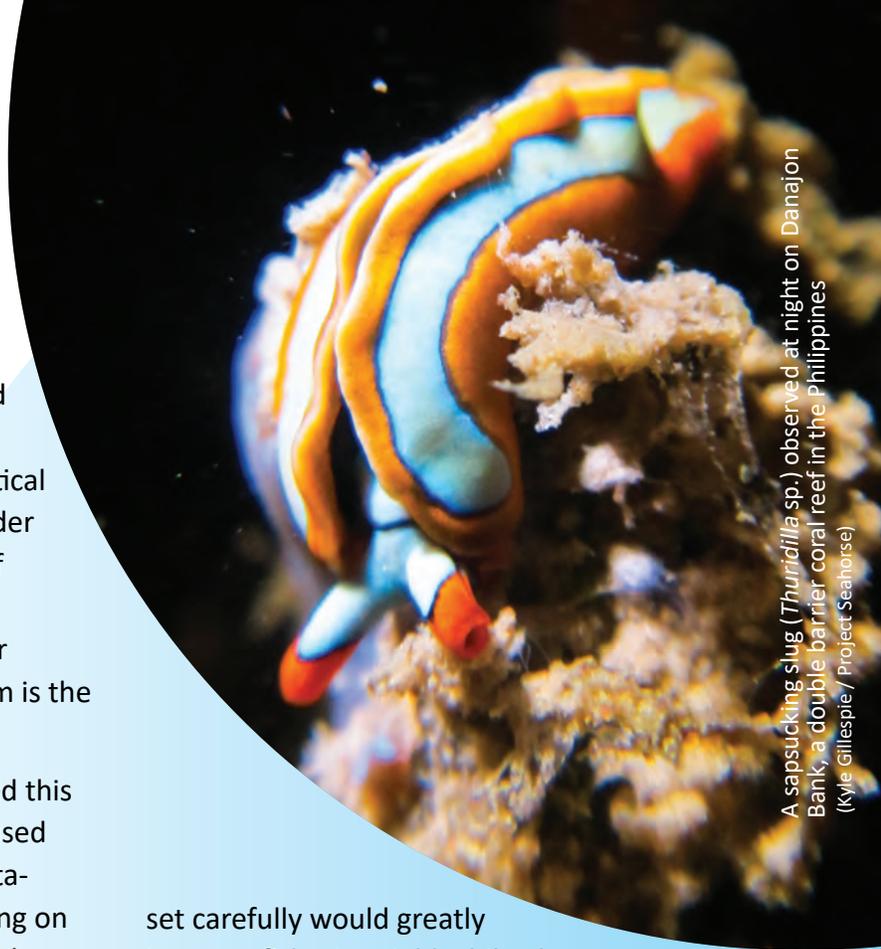
Kyle found that it is very important to consider spatial overlaps between where the fishery is operating and where the target invertebrates occur if one is to really understand the effect of the fishery. Despite being apparently very overfished, populations of these invertebrates persist. It seems that spawners from elsewhere (probably deeper waters) may be supporting populations in the fishing grounds through larval transport or migration from adjacent areas. That makes it rather important that the fishers not extend their footprint to extract from the source populations.

## Ending bottom trawling

Dr. Vincent and the Project Seahorse team are ever more determined to raise awareness about bottom trawling, and thus to promote conversation and action. Dr. Vincent spoke to the Royal Geographic Society (UK) and CNN about the detrimental fishing practice, how bottom trawling and the global wildlife trade are affecting seahorses and the seas, and what might be done about it.

Listen here: [projectseahorse.org/time-to-end-bottom-trawling](https://projectseahorse.org/time-to-end-bottom-trawling)

[projectseahorse.org/limiting-fisheries](https://projectseahorse.org/limiting-fisheries)



A sapsucking slug (*Thuridilla* sp.) observed at night on Danajon Bank, a double barrier coral reef in the Philippines (Kyle Gillespie / Project Seahorse)

# Regulating trade

We discovered a huge trade in seahorses for traditional medicine, curiosities, and ornamental display. We then used our research and policy work to create global restrictions on export trade in seahorses, the first for any fully marine fishes. Our initiatives to improve implementation of export controls, with a focus on stopping illegal wildlife trade, continue to set precedent for marine fishes.

## CITES makes a measurable difference to the trade in live seahorses

We're delighted to report on what is probably the first quantitative analysis of how CITES\* has influenced the international trade in marine fishes. It was exciting to discover that listing seahorses on CITES Appendix II – which we catalysed – appears to have led to reduced pressure of international trade for some of their wild populations, those that are primarily fished for the **live** aquarium trade. As regulation of wildlife trade is one of our primary goals, such signs of progress matter, especially given our leadership in this work for more than twenty years.

Even though the vast majority of seahorses are traded **dried** for traditional medicine, the relatively small **live** trade for ornamental display is the main pressure on some populations. We used CITES official data and industry interviews to investigate changes in the international trade in **live** seahorses over time, exploring the influence of the CITES listing and its compliance process called the Review of Significant Trade. Our analyses included a global overview and an examination of the two main destination markets for the **live** seahorse trade: the European Union and United States.

We found that listing seahorses on CITES has changed the **live** trade in two significant ways:

(1) volumes of **live** seahorses in international trade declined considerably over time; (2) the **live** trade shifted from sourcing wild seahorses to captive bred ones. In contrast, the enormous trade in **dried** seahorses remains very problematic after CITES listing, with large volumes of smuggled seahorses.

The difference between **live** and **dried** seahorse trade probably arises from smaller volumes in live trade, difficulty smuggling live fish, consumer preference for cultured seahorses, and good regulatory capacity of destination countries. The missing step in assessing the value of CITES implementation for wild seahorse populations is good monitoring to determine how they are actually responding to the trade changes we document.

Our findings will be considered by CITES Parties as they make efforts to improve implementation of the Convention for seahorses. These findings are also timely as CITES recently began a process to consider its role for conserving marine species traded for ornamental display. As well, CITES member countries will debate adding new marine fish species to CITES Appendices at the upcoming CITES Conference of the Parties in November 2022.



Barbour's seahorse (*Hippocampus barbouri*) is widely used in traditional medicine, curios and for the aquarium trade (Ronny De Pessero / Guylian Seahorses of the World)

## How is the CITES listing for seahorses being implemented in Asia?

In another landmark analysis we looked at how the CITES Appendix II listing for seahorses was being implemented in Asia. We focused on six countries that were primarily seahorse exporters – five of which had banned most or all seahorse exports – and four jurisdictions that were key importers for dried seahorses. Globally, most countries that historically exported large numbers of seahorses report having suspended exports, yet high levels of dried trade clearly persist. There is an urgent need to raise awareness of and address such smuggling. Our study documents trade bans/suspensions for seahorses, investigates how such controls are being implemented and/or enforced, and explores the roles of government agencies in implementation and/or enforcement. We further highlight the strengths and challenges jurisdictions face in meeting their obligations to seahorses, with an aim of generating recommendations for improved implementation of the Convention.

### \*What is CITES?

CITES - the Convention on International Trade in Endangered Species of Wild Fauna and Flora – is a critical tool for the conservation of wild animals and plants threatened by international trade. Seahorses were the first fully marine fish species added to Appendix II in 2002 despite the Convention entering into force in 1975. An Appendix II listing means that all exports must be justified as not threatening wild populations, legally acquired, and monitored. Seahorses were also the first marine fishes to go through a CITES compliance process called the Review of Significant Trade. As such, seahorses offer an important case study to understand how CITES action affects wildlife exports.

# Publications

Foster, S.J., Justason, T., Magera, A.M. & A.C.J. Vincent (2021). Changes in the international trade in live seahorses (*Hippocampus* spp.) after their listing on CITES Appendix II. *Fisheries Centre Research Reports* 29(4) 115pp.

Foster, S.J. & A.C.J. Vincent (2021). Holding governments accountable for their commitments: CITES Review of Significant Trade for a very high-volume taxon. *Global Ecology and Conservation* 27:e01572. <https://doi.org/10.1016/j.gecco.2021.e01572>\*

Gillespie, K.M. (2021). *Accounting for the other 95%: conservation and assessment of data limited marine invertebrates in the Central Philippines*. Ph.D. dissertation. The University of British Columbia. <https://dx.doi.org/10.14288/1.0400142>

Pollom, R.A., Ralph, G.M., Pollock, C.M. & A.C.J. Vincent (2021). Global extinction risk for seahorses, pipefishes and their near relatives (Syngnathiformes). *Oryx* 55(4):497-506. <https://doi.org/10.1017/S0030605320000782>\*

Stanton, L.M., Foster, S.J. & A.C.J. Vincent (2021). Identifying national conservation status, legislation and priorities for syngnathid fishes globally. *Fisheries Centre Research Reports* 29(2) 43pp. <https://dx.doi.org/10.14288/1.0401950>

Vaidyanathan, T. (2021). *The limitations of bans when conserving species that are incidentally caught: a case study of India's seahorses*. Ph.D. dissertation. The University of British Columbia. <https://dx.doi.org/10.14288/1.0401560>

Vaidyanathan, T. & A.C.J. Vincent (2021). State of seahorse fisheries in India, nearly two decades after they were banned. *Biodiversity and Conservation* 30(7):2223-2253. <https://doi.org/10.1007/s11242-021-02188-6>\*



Sarah Foster photographing dried seahorses and pipefish for sale in Cambodia (Adam Hicks / Project Seahorse)

For a complete listing of our publications, visit: [projectseahorse.org/resource](https://projectseahorse.org/resource)

For more news, visit: [projectseahorse.org/news](https://projectseahorse.org/news)

\* peer-reviewed journal article

# Partners & donors

Our sincere thanks to our partners and donors for their ongoing support of our work to advance marine conservation. Together we will save seahorses, and the seas.

## OUR HOME INSTITUTIONS



The University of British Columbia hosts much of the team. Director and co-founder Prof. Amanda Vincent is a Professor in the Institute for the Oceans and Fisheries.  
[www.oceans.ubc.ca](http://www.oceans.ubc.ca)



The Zoological Society of London is our other home base. Prof. Heather Koldewey, Project Seahorse co-founder, is a Senior Technical Advisor at ZSL and Associate Professor at Exeter University.  
[www.zsl.org](http://www.zsl.org)

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Special thanks to an anonymous donor who for many years provided essential support to Project Seahorse. Thank you also to our volunteers and interns around the world for their enthusiastic dedication.

For past and present partners and donors, see: [projectseahorse.org/about-us/who-we-are/](http://projectseahorse.org/about-us/who-we-are/)

Bargibant's seahorse, *Hippocampus bargibanti* (Edwin van der Sande / Guylan Seahorses of the World)

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