



Shoal

Annual Review 2021



MISSION

To **halt** the extinctions and **recover** populations of threatened freshwater species in the wild.

VISION

A world where all native freshwater species have the conditions needed for them to **thrive** in their natural habitats, where the extinction crisis in the world's freshwater ecosystems no longer exists.

Shoal is a programme of Synchronicity Earth and Re:wild. Synchronicity Earth is a charity registered in the UK and Wales No: 1132786 and a company limited by guarantee No: 06952204. Re:wild is a U.S.-based 501(c)3 non-profit corporation.

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A note from our Executive Director

When we launched Shoal in 2019, we clearly never anticipated a year like 2020. The pandemic forced our partners to stall and postpone activities under Shoal's first field projects and the uncertainties made planning and therefore action very difficult. But in 2021, despite the remaining challenges we were able to get back on track and make welcome progress.

It has been a year of successes and most importantly the year when we began to make the conservation impact we were created to achieve. This year we successfully raised the funds for five partner projects in Asia, including programmes for peat swamp fishes in Malaysia, and continued the work to restore Sulawesi's ancient lakes. We built a partnership for action on Lake Tanganyika and supported work in Mexico. This is important, as it proves Shoal's ability to work effectively with partners and turn planning in to action.

We are delighted to have launched a first formal partnership with global leader in indoor aquatics, OASE, who have shown real leadership and commitment to conservation by becoming our first corporate partner. Their support will be instrumental in facilitating Shoal's work across five continents and in 15 countries. More specifically, OASE are the major sponsor for the search for the fat catfish in Colombia, one of the Top 10 Most Wanted species from our flagship Search for the Lost Fishes programme.

Search for the Lost Fishes, in partnership with Re:wild, is designed as a bridge between inspiration and conservation impact. Launched in the summer, it has already garnered a great deal of interest, spurred on by public participation in the Lost Fishes Art Challenge, and catapulted into the mainstream media with the rediscovery of the Batman River loach in southeast Turkey in October by Dr Cüneyt Kaya and Dr Münevver Oral. Thanks to their hard work, a species that hasn't been seen in nearly 50 years – and was thought to be extinct by some experts – now has international attention and a chance to be on the road to recovery.

Throughout 2021 we further strengthened our relationship with the aquarium hobby and have been further accepted as its go-to conservation partner. The Ornamental Aquatic Trade Association (UK) and Practical Fishkeeping Magazine have fully endorsed Shoal as the platform for the hobby to engage with conservation. Together with Shoal, they have launched a campaign called SOS: Support Our Shoal to drive more engagement in conservation. This, together with the first corporate partnership, gives Shoal the perfect space to accelerate impactful work through 2022.

As 2021 was the year Shoal focused on the 'proof of concept' stage, 2022 will be an important year to further consolidate the operational base for its programmes. It will be a year of significant landmark publications, state of the art storytelling, and deepening conservation impact in the six priority regions.

As ever, we are deeply thankful to all of our partners and supporters who share in the successes we have achieved this year and we hope you will join us as we continue to drive forward throughout 2022.

Mike Baltzer

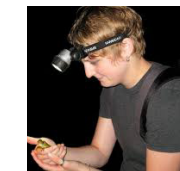


Reflections from our colleagues



NINA SEALE
Communications and Engagement Officer,
Synchronicity Earth

2021 was when Shoal launched its first public awareness raising campaign: the Search for the Lost Fishes. What a success it has been so far! It was such a pleasure to watch hundreds of people enthusing about the beauty and mystery of these long-forgotten fish species online, submitting wonderful artwork to the art challenge, and then to close the year with the incredible news that the Batman River loach had been rediscovered. Shoal is leading the movement to get freshwater life the attention it needs and deserves from the conservation community and beyond.



LINDSAY RENICK MAYER
Director of Communications,
Re:wild

Shoal is a great partner for the kind of storytelling that inspires people not only to be interested in freshwater fish, but to want to take action to help conserve them and their ecosystems. In the Search for the Lost Fishes partnership, for example, we are together tapping into messages of hope and adventure that inspire and intrigue. Now that the programme has launched, we are looking forward to helping raise the profile both of Shoal and the freshwater fish the organisation champions.



DEVIN MURPHY
Senior Communications Specialist,
Re:wild

2021 was an exciting year for Re:wild's Search for Lost Species programme. Shoal was the first partner to join the programme and create the first official extension of it - Search for the Lost Fishes. The stories that have already come out of Search for the Lost Fishes have been tremendous vehicles to tell stories about freshwater species, and spark conservation for them. Together, we're going to be able to raise the profiles of lost fishes for years to come.



FÉLIX FEIDER
Programme Officer,
Synchronicity Earth

Increased ambition and support for freshwater conservation has never been more critical, as freshwater species and ecosystems lie at the nexus between the global biodiversity, sustainable development, and climate agendas. It has therefore been encouraging to see Shoal's strategy move from planning to implementation. Over the past year, we have worked together to restore endemic freshwater populations in Sulawesi and identify plans to protect Malaysia's rare and unique blackwater fish and the peat swamp forests they inhabit. I am convinced that Shoal will be able to build on the strong foundation laid in 2021 and catalyse freshwater conservation support across the world.

A year in freshwater: 2021 at a glance

MEXICO: Conservation of two critically endangered species

A project launched for the Blackspot allotoca, and the world's first non-fungible token for conservation: p. 13.

COLOMBIA: Search for the Fat catfish underway

Our partners Ictiología y Cultura began the search for the mysterious Fat catfish of Lake Tota. Learn more about our Search for the Lost Fishes programme: p. 14.

TANZANIA: Project development

Development of a project to conserve 9 species from Lake Tanganyika, and create the first dedicated freshwater nature reserve in the Tanzania area of the lake: p.13.

SOUTHEAST ASIA

Southeast Asia is a major priority region for Shoal. Learn about our work in Malaysia, Indonesia and Vietnam: p. 10-11.

TURKEY: Batman River loach rediscovery

Dr Münevver Oral and Dr Cüneyt Kaya found the first of the species on the Search for the Lost Fishes Top 10 Most Wanted list late last year, causing waves of media interest that spread globally. Learn about their expeditions to the Batman and Diyarbakir regions of Turkey on their hunt for this elusive species: p.16-17.

INDIA: Hump-backed mahseer, Red line torpedo barb, and Ghosts Beneath Our Feet

Learn more about activity throughout 2021 to conserve the Hump-backed mahseer, and the development of programmes to conserve the Red line torpedo barb - also known as the Denison's barb - and the subterranean fishes of the Western Ghats: p. 12.

NEW CALEDONIA Dumbéa River pipefish

A species that was originally on the Top 10 Most Wanted list of Search for the Lost Fishes wasn't lost after all. Learn about how a citizen scientist listing on iNaturalist changed knowledge of the Dumbéa River pipefish : p. 14.

CONSERVATION ACTION

Throughout 2021 we focused our direct conservation action across four key regions: Southeast Asia (particularly Indonesia, Malaysia, and Vietnam), India's Western Ghats, Lake Tanganyika, and Mexico.

Our Search for the Lost Fishes campaign was launched in June, and the first species was already rediscovered before the end of the year, when Dr Münevver Oral and Dr Cüneyt Kaya found populations of the Batman River loach in the Han and Sarim streams in Turkey. After this rediscovery, Shoal funded an expedition for Oral and Kaya to return to the region to assess the range and distribution of the species in order to better conserve it.

Read on to learn more about the impact our partners and Shoal have had across each of these areas.



Southeast Asia

Shoal's most developed regional programme is focused on Southeast Asia. The main umbrella project of this programme is a partnership with the **IUCN ASAP** and **Mandai Nature** to initiate immediate action for ASAP fishes (there are currently 92 critically endangered species of fish under ASAP). The first priority of this partnership has been to develop an Action Plan for ASAP fishes. The first draft is nearly finished, with the aim to publish in early 2022.

During the development of the action plan, Shoal started conservation action for two of the priorities, and developed plans for two more.

The largest project under this regional programme is Southeast Asian peat swamp fishes, which started in 2019 and developed significantly throughout 2021. Funding has been secured for survey work in two top priority areas (Johor and Pahang states) in Peninsula Malaysia with the aim of creating new protected areas for endangered peatswamp fishes. The project is led by **Global Environment Centre** and the **University of Malaysia Terengganu**.

In Indonesia, Shoal has initiated discussions with the **Katingan Mentaya Project** in Central Kalimantan, and hope to undertake surveys and conservation action there in 2022. We are also collaborating with the **Prigen Conservation Breeding Ark** who has started a very significant and timely breeding programme for peat swamp fishes.



Kavita Prakash-Mani

“Freshwater fish are in freefall with 80 species declared extinct and another third threatened with extinction. And even though millions of people depend on fish for their food security and livelihoods, rivers and lakes continue to be polluted, dammed and overfished. We are committed to protecting freshwater fish in Southeast Asia, and our collaboration with Shoal and the Asian Species Action Partnership is fundamental to our work in the region”.

- Kavita Prakash-Mani, CEO, Mandai Nature

The second main project is the Ancient Lakes of Sulawesi Programme. This project started in Lake Mahalona with support for the restoration of the lake, principally by the removal of invasive fishes. Shoal supports the local partner, **Yayasan Bumi Saweridaging** together with **IUCN** and **Synchronicity Earth**. Local villagers have undertaken regular removal of invasive fish, and initial indications from the biomonitoring assessments show that the populations of invasive fish are reducing, and the endemic fish may be recovering. However, this is only preliminary data from pilot activities. In 2021, Shoal began to develop a project in Lake Poso with partners and has begun fundraising for action in 2022.

In addition, funds have been provided by **The Fishmongers' Company** to support the first ever fish surveys in three protected areas in southern Vietnam. These sites comprise rare arid habitat in Vietnam and may well support a unique community of fish. Shoal hopes to scale up action in Vietnam in 2022.

In 2021, Shoal also began to develop a project focused on the large migrant Mekong fishes (another priority identified as part of the ASAP Action Plan) in collaboration with a number of potential partners including the Wonders of the Mekong Initiative together with Dr. Zeb Hogan.



Courtesy of Christian Hinz, via Wikimedia

Our partners



FEATURED PARTNER:

GLOBAL ENVIRONMENT CENTRE

Global Environment Centre (GEC) was established in 1998 in Malaysia to work on environmental issues of global importance both in the region and internationally. It supports information exchange and capacity building, and undertakes strategic projects particularly in developing countries. It is the leading NGO working on peatland conservation and management in Southeast Asia, making them the obvious partner for Shoal's Southeast Asian peatswamp fishes project. GEC provides technical advice on the management and restoration of peatlands and is actively involved in the restoration of peatlands including the Pekan Forest Reserve and with indigenous communities in Pahang in Peninsula Malaysia. In 2019, GEC agreed to help coordinate an action plan for peatswamp fishes in Malaysia with Shoal and other partners and since then GEC became the main partner for Shoal in Malaysia. Following the drafting of the action plan, GEC together with the University of Malaysia Terengganu and the Parosphromenus Project with support from Synchronicity Earth, have begun fish surveys in remaining patches of peatswamp in Johor and the first extensive surveys in a large area of peatswamp forest in East Pahang.

More information on GEC can be found at: gec.org.my

Western Ghats

FEATURED SPECIES:

GOLLUM SNAKEHEAD AENIGMACHANNA GOLLUM

When extensive flooding in the Western Ghats in 2019 washed out a large, unfamiliar fish, a local fisherman was quick to show off his catch on social media. It was a sharp-eyed Shoal advisor and partner project lead, Dr Rajeev Raghavan at KUFOS that quickly recognised this fish was something new to science, naming it *Aenigmachanna gollum*. In 2020, Dr Raghavan and his colleagues described this fish as belonging to an entire new family. It was originally placed in the normal family of snakeheads, Channidae but it was finally recognised to be so unique that a new family had to be created to fit it in. The new family, Aenigmachannidae, means enigmatic snakeheads. This incredible species lives deep underground and was named after the Tolkien character Gollum. The Gollum snakehead represents eleven species that Shoal is committed to supporting under the Ghosts Beneath Our Feet: Conservation of the Subterranean Fishes of Western Ghats project, together with Dr Raghavan



© Ralf Britz

Shoal began its support in this incredible region in 2019, with support for the conservation of the Hump-backed mahseer led by to the **Mahseer Trust** and the **Kerala University of Fisheries and Ocean Studies (KUFOS)**. The programme has extended to a focus on the Denison's barb and subterranean fishes.

The Hump-backed mahseer (*Tor remadevii*) project, supported by Shoal with funds from **The Fishmongers' Company**, has been held back by travel restrictions related to the COVID-19 pandemic. However, in 2021, the team was able to make incredible progress despite the challenges. They have now mapped critical habitats for the species in the Kabini, Bhavani and Pambar tributaries of the Cauvery river. They also confirmed the presence of two non-native species that are considered the main threat to this critically endangered species. The study also shows that dams have held back the spread of the invasive fish, and the Hump-backed mahseer has been able to survive in certain areas that are free from non-native mahseer. These areas will now be the focus of direct conservation efforts, led by local communities including tribal people heavily reliant on the rivers and traditionally the Hump-backed mahseer.

In December 2021, Shoal launched a new project targeting the conservation of the Red line torpedo barb, also known as the Denison's barb. This small, beautiful endangered species is prominent in the ornamental fish trade. After it first appeared in the hobby in 1996, the species went into rapid population decline until government restrictions and captive farm breeding relieved some pressure on the wild population. Shoal will be supporting its partner, **Zoo Outreach** to put in measures to recover populations in eight major rivers in the Western Ghats. (see page 19).

Support for the subterranean fishes of the Western Ghats has not yet been found and so project activities with Shoal have not yet started. We hope to find funds to contribute to the project in 2022.

Dr. Sanjay Molur



"Denison's Barb is a very popular fish in the trade with both wild-caught and captive individuals finding their way into international trade. Zoo Outreach Organization's partnership with Shoal is to establish conservation of the fish and its freshwater co-inhabitants and sustainable livelihood practices of the fishers who are dependent on the species.

— Dr. Sanjay Molur, Executive Director, Zoo Outreach Organization



Rift Valley Lakes

The rift valley lakes of Africa support the world's most diverse and threatened communities of freshwater fish, and are therefore a high priority for Shoal. Shoal made the strategic decision to support efforts to protect and recover populations of endemic cichlids in Lake Tanganyika as the first project in this region.

In 2020, Shoal identified a potential partner and a project focused on conserving 9 species and create the first dedicated freshwater nature reserve in the Tanzanian part of Lake Tanganyika. In 2021, the project was fully developed with consultations with other organisations with experience of conservation of the lake, including **The Nature Conservancy**. In 2022, a new organisation committed to supporting conservation of the lake - **Sustain Lake Tanganyika** - will be launched. The project will comprise creating a new protected area, developing aquaculture facilities for indigenous Tanganyika tilapia species, and captive breeding of cichlids for supply to the ornamental trade.



© Lake Shore Lodge



Mexico

Mexico was also selected as a high priority region for freshwater fish conservation, highlighted by 44 critically endangered species and high levels of very localised endemism. Shoal has been exploring potential targets for support and in 2021, two species became the focus of our attention. A project for the Blackspot allotoca *Allotoca maculata* was developed and launched with Prof. Topiltzin Contreras Macbeath (**University of Morelos**) and Prof. Omar Dominguez (**Michoacana University of Mexico**) - Shoal's two main partners in Mexico. Fundraising for the project was started in 2021 but not enough funds have been acquired to start activities yet.

A second species, the Dark-edged splitfin *Girardinichthys multiradiatus*, was selected to be one of three species of #NatureCollectibles, the first threatened species based non-fungible tokens (NFTs) launched by IUCN at the 2020 World Conservation Congress held in September 2021. The sale of #NatureCollectibles will raise guaranteed funds for the splitfin, and resale and trade of the collectibles will provide further funds, should this unique and innovative scheme become successful in the longer term.



© Wolfgang Gessl



Search for the Lost Fishes

In June we launched the flagship Search for the Lost Fishes campaign.

In collaboration with **Re:wild** and the **IUCN-SSC Freshwater Fish Specialist Group**, we identified a master list of more than 300 freshwater fish species that haven't been formally recorded in over a decade, but haven't been classified as extinct by the IUCN Red List. There is reason to hope and believe these species are still out there, surviving in pockets of habitat where they'll hopefully be rediscovered by scientists and given a better chance to flourish once again.

From this master list, we chose a Top 10 Most Wanted list. These are the species we'll initially focus our attentions on. We'll raise the funds to send expedition teams to the areas where the species may still exist, and hopefully install conservation programmes to help bring the species back from the brink.

These Top 10 range from locations around the world, from Colombia to Madagascar, from Iraq to Papua New Guinea. The creatures have strange and exotic names like the Duckbilled buntingi, Syr Darya shovelnose sturgeon, and Fat catfish, and each of them has remarkable stories that surround it.

And one of the species has already been rediscovered! Read overleaf to learn about Dr Cüneyt Kaya and Dr Münevver Oral's rediscovery of the Batman River loach, nearly 50 years after the species was last seen.

The first iteration of the Top 10 Most Wanted list included the Dumbéa River pipefish *Micropphis cruentus*: an exquisitely beautiful pipefish from the clear and calm waters of New Caledonia's Ouenghi River. As we began to research the species, we came across a 2020 recording of the pipefish on citizen science and naturalist social network iNaturalist. Turns out the species wasn't lost after all: Damien Brouste and Nicolas Charpin, residents of New Caledonia, recorded a small population of a species that some experts previously had every reason to believe was extinct. This story really highlights how powerful citizen science can be in filling knowledge gaps.

To coincide with the Search for the Lost Fishes campaign, Shoal and our partners **Synchronicity Earth** and **Conservation Optimism** launched the Lost Fishes Art Challenge as a way to better engage people outside of conservation circles and to help bring the species to life. We put the word out on Twitter through the tremendously active #SundayFishSketch community, fired off a few emails, and waited to see if anybody would bite.

When the challenge went live in July, we had no idea what the uptake might be. But over the coming weeks, we were delighted to see a steady stream of excellent entries from right around the world – Sweden to Australia, Mexico to South Korea, South Africa to Hong Kong – with artworks created in a whole range of mediums: sculpture, collage, watercolour, ink and more.

It was a real joy to get to the computer on a Monday morning and check the inbox for all the entries that had been submitted over the weekend. And heartening to know that the challenge captured so many people's imagination.

The challenge ran until the end of September, when the Shoal, **Synchronicity Earth** and **Conservation Optimism** team made a shortlist of entries for each species before sending them to our judging panel to finalise.

Jeremy Wade, Dr Eleanor Adamson, and Ivan Mikolji announced the winners during an entertaining livestream that was broadcast on Ivan's popular YouTube channel, as well as Shoal and **Synchronicity Earth's** social networks. The discussion has now been watched thousands of times, with excited feedback from viewers around the world.

Each of the category winners of the art challenge had their work exhibited in the Oxford University Museum of Natural History during a three-day exhibition. Seeing their work displayed next to dinosaur skeletons in a room that contains the world's only surviving dodo soft tissue remains, under the watchful eye of a 19th century statue of the great Charles Darwin, put the Lost Fishes – and the artworks that had brought them to life – in a poignant perspective. Give these species a chance, or they'll go the way of the dinosaurs and the dodo.



Dumbéa River pipefish © Damien Brouste



Lost Fishes Art Challenge exhibition at Oxford University Museum of Natural History



Two of the Lost Fishes Art Challenge winners: Joanna Bowley's Fat catfish (left), Chrysteena Garcia's Annamite barb (right)



Dr. Eleanor Adamson

"Judging the art comp was a rare privilege for me – just realising the extent of the worldwide community interested in freshwater fishes (plus the talent to reimagine them in artwork!) fills me with optimism – as does the rediscovery of the Batman River loach – a truly heartening step on the way to protecting freshwater fishes!"

– Dr. Eleanor Adamson, Fisheries Programme Manager, The Fishmongers' Company

Ivan Mikolji

"When I first heard about Shoal's Lost Fishes Art Challenge, I knew I had to be part of it! As an artist and conservationist, I am thrilled to see threatened freshwater fish species making major headlines in such an innovative way. The response and participation were amazing and showed the power art has in creating empathy. This initiative bridged many worlds, uniting nature, preservation, and art. As I always say, you cannot preserve something that you don't know exists

– Ivan Mikolji, River Explorer and Artist, Mikolji

Jeremy Wade

"I thought this competition was a really effective way to draw attention to our lost fishes. Fish are a great subject for artwork – but the fact that we can only see these ones in our imagination, or brought alive by the imagination of others, is incredibly poignant. Despite the shortage of visual references to work from, the entrants rose to the challenge with a great mix of technical expertise and inventiveness – to produce a stunning shoal!"

–Jeremy Wade, Television Presenter and Angler



Batman River loach

Dr. Münevver Oral



“The rediscovery of the Batman River loach has been our most significant achievement of 2021. Since then we have visited the region twice and what we understand is that problems and threats are complex and decisions require full collaboration of all stakeholders, including local and national governors, NGOs, and opinion leaders to ensure the conservation of the Batman River loach in its very limited habitat. However, both Cüneyt and I are willing to do whatever it takes to protect the precious loach”.

— Dr. Münevver Oral, Research Fellow, Recep Tayyip Erdogan University



In December, we announced the rediscovery of the Batman River loach *Paraschistura chryscristinae*: the first time the species has been seen since 1974, and the first of the Lost Fishes to be rediscovered.

Dr Cüneyt Kaya and Dr Münevver Oral from the Recep Tayyip Erdogan University in Rize, Northeast Turkey, initially found 23 individuals of the little loach in two populations in the Han and Sarim streams, during an expedition in October. They returned to the area in November, where they once again found populations of the fish.

“I’ve been researching this area for 12 years and this fish was always on my wishlist,” said Kaya. “It’s taken a long time. When I saw the distinctive bands on the fish, I felt so happy. It was a perfect moment.”

The tiny critter, growing up to 1.4 inches (or 36 millimetres) long, was once distributed around streams and tributaries of the Batman River, but it was feared that the construction of the Batman Dam between 1986 and 1999 fragmented the loach’s habitat to such an extent that it drove the species to extinction. Both populations that Kaya and Oral found were upstream of the dam.

Kaya said: “It is obvious that the establishment of the dam caused shifts in biodiversity due to degradation of the lower part of the habitat needed by the species”.

Kaya believes the other threats facing the species are likely to be pollution, drought, and invasive species. “As far as I know, there is no industrial pollution above the points where we identified the species. We must ensure that it does not happen in the future”.

Oral added that: “Man-made pollution is an issue, so we need to increase the awareness of local people. There could also be invasive species. We don’t know the ecology of the species, so we need to do more research.”

The team did more research during another expedition to the region over Christmas. They braved icy water, frozen roads and relentless rain to reach the Han and Sarim streams. Due to the turbidity caused by heavy rains, they were able to conduct two days of river assessments before deciding their time would be better spent raising awareness of the species and freshwater species conservation with local schools.

“Students were very curious and keen to learn more about the loach,” said Oral. “Teachers asked for further readings and we sent our presentation to every school. At the end of the seminars, we made a deal with the students to spread the word about the loach and what they learned during the seminar . Given their interest, we hope that they will spread the word about the rediscovery and how to protect the ecosystem”.

There was extensive media about Kaya and Oral’s rediscovery, with The Guardian, The Washington Post and more than 80 local and national publications around the world publishing the story. Kaya and Oral have become minor celebrities in Turkey after appearing on the news for many days in a row, and politicians in the country are inviting Leonardo di Caprio to the Batman province after he tweeted a link to a Mongabay article about the rediscovery.

Batman has indeed returned.



Dr. Cüneyt Kaya



“The rediscovery was an important step, however what is more important now is to start conservation action for the Batman River loach in its very restricted habitat. We work in collaboration with established researchers in the field internationally as well as the IUCN for Facilitating Species Conservation Planning Workshops online”.

- Dr. Cüneyt Kaya, Associate Professor Recep Tayyip Erdogan University

INSPIRE

'Inspire' is one of our key strategic pillars, along with Partner, Research, and Act.

It stems from an understanding that people need to be inspired by the species found in freshwater if they are going to help save them.

There is a fantastically complex treasure trove of the weird and wonderful, the surprising and stunning, the colourful and curious found in the planet's freshwaters, but still these stories are seldom told. Even big budget nature documentaries seem to struggle in uncovering the world of wonder hidden beneath the surface of rivers, lakes and wetlands.

The following pages highlight what we have been doing to inspire people to take action for threatened freshwater species and, in the case of OASE, how we are being helped in this mission.



SOS: Support Our Shoal

Dominic Whitmee



“Conservation of the world’s freshwater fishes is very important to us. We are therefore very excited about the launch of the SOS: Support Our Shoal campaign and the Save Denise’s Friends! appeal which we hope businesses and aquarists alike will support in whatever way they can”.

- Dominic Whitmee, CEO, OATA

Peter Carey



“Often conservation can feel remote and hard to connect to, but the Save Denise’s Friends! campaign features a very familiar fish to fish keeping hobbyists and gives an excellent example of how conservation is not remote and only concerned with species of fish that are not well known, but is directly linked with the hobby. The educational messages of conservation and the real life projects of Shoal bring conservation and an understanding of its importance to everyone in a way that connects and inspires”.

- Peter Carey, Head of Global Innovation, CASCO Pet

Our SOS: Support Our Shoal campaign was launched towards the end of the year as a bridge between the home aquarium community in the UK and impactful conservation work around the world, and puts the power right in the hands of the businesses and individuals that make the community such a rich, diverse, and exciting place.

Developed with expert guidance from the **Ornamental Aquatics Trade Association (OATA)** and **Practical Fishkeeping** magazine, SOS: Support Our Shoal will be a multi-year fundraising campaign that provides a reliable channel to direct funding towards the conservation projects that are needed most.

Mike Baltzer said: “The launch of the SOS: Support Our Shoal campaign is a rallying cry to those who care about what is happening to freshwater species and want to be part of the solution. Shoal provides a reliable platform for the aquarium world to fund conservation projects that really work. This is a landmark time for the aquarium community, and collaborating with us is a demonstration that it is beginning to take conservation seriously”.

The first appeal under the SOS banner is to “Save Denise’s Friends!” – wild populations of the popular Red line torpedo barb *Sahyadria denisonii*, also known as the Denison’s barb (see following page).



© Rajeev Raghavan

Denise is the name we’ve given to represent the Denison’s barbs that are much loved and well looked after in people’s home aquariums. Her friends are her wild cousins from the Western Ghats in India, where they are endemic. Unfortunately, the barb’s striking good looks have been the species’ downfall: when it was introduced to the aquarium hobby, it was collected and sold around the world so much that the population declined rapidly. In 2010, the fish was officially declared endangered.

Since then, most of the fish you can buy in the aquarium shops have been bred in captivity, so the pressure on wild populations has partly been reduced. But Denise’s friends have still been still collected at high, unsustainable rates. Coupled with new issues such as fishing with dynamite by irresponsible food fisheries, destruction of their habitat, and pollution, the barb in the wild could soon face extinction.

The Save Denise’s Friends! appeal has the ambitious target of raising £200,000 over two years. This won’t be easy to achieve, but we are aiming high and will prioritise the appeal throughout 2022.

Get in touch with us or head over to the SOS microsite to get involved.



Anikatipalla, via Creative Commons



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Save Denise’s Friends!

Nathan Hill



“In the world of conservancy, focus is everything. The IUCN has so far

assessed less than half of the 33,000+ known species of fish, and ranked over 2,000 of them as somewhere from vulnerable to critically endangered. With such a considerable number, it’s easy to become overwhelmed, paralysed by helplessness, and so ‘Save Denise’s Friends!’ was chosen as a cause to centre the public gaze on one immediate, preventable tragedy – that of the Red line torpedo barb. By directing attention to a single conservation target, rather than diluting efforts across multiple species, Shoal and Practical Fishkeeping hope to see tangible, measurable differences enshrined around the ways in which we manage and interact with this incredible species. And then it’s on to the next, until eventually every fish is in a better place.”

- Nathan Hill, Editor, Practical Fishkeeping

Forgotten Fishes

The release of The World's Forgotten Fishes report in February was the first time Shoal, WWF, and 15 other leading conservation organisations collaborated at the same time to call on governments to commit to an Emergency Recovery Plan for global freshwater biodiversity.

It explains the reasons behind the catastrophic decline in fish species populations and, crucially, sets out the Emergency Recovery Plan that is needed to guide policymakers:

1. Allowing rivers to flow more naturally.
2. Reducing pollution.
3. Protecting critical wetland habitats.
4. Ending overfishing and unsustainable sand mining.
5. Controlling invasive species.
6. Safeguarding and restoring connectivity.

The report is a urgent call to arms for authorities to ramp up their action towards conserving freshwater ecosystems. Bold, ambitious prioritisation will be essential if we are going to bend the curve of the biodiversity crisis and safeguard the futures of freshwater species. According to 'Forgotten Fishes', '2021 may be the last chance for governments to chart a new course that could reverse the loss of nature and put the world back onto a sustainable path'.

The release of the publication was immediately jumped on by the world's media, and the response was huge:

- Over **400 articles** published in more than 45 countries.
- Al Jazeera, BBC World TV, Sky News, RTVE International, Dutch national news.
- Reach of over **6 million** for the #ForgottenFishes hashtag.
- Overall reach of more than **2 billion** (data from WWF).



'Forgotten Fishes' proves the effectiveness of cross-collaboration among NGOs, and a significant reason for the report's influence is the multiple logos of high-profile and well-respected conservation NGOs on the front cover.

The media are interested. But will governments sit up and notice, and prioritise the forgotten fishes of the world's rivers, lakes and wetlands? Time will tell.

OASE showed real leadership and commitment to conservation when they became our first significant corporate partners in November.

Throughout our partnership, OASE will be instrumental in facilitating Shoal's work across five continents and in 15 countries. More specifically, their support will target the search for the Fat catfish *Rhizomichthys totae* on an expedition to Colombia's Lake Tota early in the year (see '2022 Highlights, p.24).

Thorsten Muck, OASE's CEO, explained what the Fat catfish expedition meant to the organisation: "OASE is very proud to be able to help this exciting work to look for a remarkable fish that hasn't been seen since the '50s. We hope it's found so that populations can be boosted and the species can be given a second chance at survival. But, above all, we hope that the expedition and the accompanying communication will bring more attention to species conservation".

Mike Baltzer said: "This is an exciting, watershed moment for freshwater species conservation. OASE is a leader and innovator in the aquarium hobby, and by partnering with Shoal, they have shown their commitment to face the challenge with us and hopefully tackle the freshwater species crisis so neglected and overlooked until now. We hope they will be the first of many, and create a tsunami of global support across the hobby".

We are truly excited to be collaborating with OASE in this way, and we look forward to the work we will achieve together throughout 2022.



OASE Matthias Oetting, Director of Marketing (left) and OASE UK Managing Director Chris Wright



OASE's Support



"As one of the world's most successful suppliers in indoor aquatics, we feel it is OASE's duty to support organisations like Shoal. Shoal unites many strategic partners who fight together for the protection of species. We believe that this kind of cooperation has a great chance of success in species conservation and therefore find Shoal particularly worthy of support".

- Thorsten Muck, CEO, OASE

LOOKING AHEAD

The work we achieved throughout 2021 has put us in an excellent position to kick on and make further meaningful impact throughout 2022 and beyond.

We already have a number of key partnerships in the pipeline that will help us facilitate vital conservation action in Southeast Asia and South America, and there are expeditions planned to Colombia's Lake Tota, sponsored by funding from OASE, to try and solve the ever-deepening mystery of the Fat catfish.

Our direct conservation action will increase in Southeast Asia, Tanzania, Mexico, and India, and we will further deepen our ties to the aquarium hobby in the UK and beyond by expanding and focusing on SOS: Support Our Shoal and the Save Denise's Friends! appeal.

We will release two landmark reports in the first half of the year: Newly Discovered Freshwater Fish 2021, and 50 Threatened Flagship Species in Freshwater. These will both help draw attention to the threats facing freshwater species and should help in finding funding to implement solutions.

It promises to be another active and productive year!



Future partnerships



In 2021, Shoal began discussions with the **Prigen Conservation Breeding Ark (PCBA)** in Indonesia. This ex situ conservation centre is run as a joint project by Taman Safari Indonesia, KASI Foundation, ZGAP and Vogelpark Marlow. PCBA is gaining a strong reputation for successful conservation breeding of rare Indonesian species. In 2021, PCBA began to expand the collection by adding insurance populations of fishes, particularly peat swamp fishes and Sulawesi endemic fish species. This perfectly matches Shoal 's priorities in Indonesia. We are delighted that PCBA is able to provide facilities for these species. Shoal will work further with PCBA to strengthen the collection where possible and link with them to support local partner in situ activities. PCBA currently has an active partnership with the **Parosphromenus Project**, the leading Shoal partner working on the conservation of this highly threatened genus of peat swamp fishes. Shoal is looking for partners to lead on the in situ conservation of other peatswamp fishes while PCBA takes the lead on the vital role of securing insurance of some of the threatened fishes in the world.



The Prigen Conservation Breeding Ark centre, Java, Indonesia.
© Prigen Conservation Breeding Ark



Following introductions from the aquaria industry (many thanks to Dr. Tim Haywood), Shoal will be launching a partnership with the **Amazon Research Centre for Ornamental Fish - ARCOF** based in Iquitos, Peru. The centre is the only research station in the world focused on studying and conserving ornamental fish. The centre has a strong local awareness-raising capacity and is presently constructing a public aquarium to engage local people and schools. Besides the very impressive work to engage the local communities in the conservation of ornamental fishes, one of the most important projects the Centre is focused on is the conservation of the Coral red pencilfish or Pez lapiz *Nannostomus mortenthaleri*. This incredibly beautiful critically endangered fish has a highly restricted distribution and is presently threatened by overharvest for the aquarium trade. The species is not found in a protected area. Shoal aims to help raise the profile of the centre and to support action first and foremost for the pencilfish. The Centre offers excellent facilities for field research of ornamental fishes in the Peruvian Amazon.

The Amazon Research Centre for Ornamental Fish, Iquitos, Peru.
© Amazon Research Centre for Ornamental Fish



Another new, exciting partnership for Shoal to launch in 2022 is with **Progres**. Progres is a small organisation of species conservation experts dedicated to the conservation of Sulawesi's incredible endemic fauna and flora. The team is co-led by Sheherazade, a very energetic, young leading Indonesian conservation scientist, and Asnim Alyoihana with more than 20 years experience in community-based conservation. Both are originally from Sulawesi. They have conservation programmes for species such as the Sulawesi flying fox, Talaud bear cuscus, and the Forsten's tortoise. Despite having an incredibly high level of endemism on a set of islands close to the size of mainland Britain, there are remarkably few conservation organisations working in Sulawesi. We are therefore delighted that Progres has now decided to support conservation work for rare and neglected Sulawesi endemic fishes. Shoal will partner with Progres on our Sulawesi Ancient Lakes project firstly in Lake Mahalona, Lake Matano and Lake Poso – three of the world's most important lakes for fish conservation. And once we have raised enough funds, Progres will lead the work to search for the Duckbilled bunting, one of the Shoal Top 10 Lost Fishes, in Lake Poso. Progres will bring their experience of species conservation, community-led conservation, and their specialist knowledge of Sulawesi to help other partners such as Yayasan Bumi Sawerigading, Shoal's partner in Lake Mahalona, local universities, and the youth community.



Sherazade, Co-Executive Director, Progres.
© Progres

Brian Zimmerman



"I'm really pleased to see the rapid success from Shoal's campaign Search for the Lost Fishes. Not only success in finding some of these enigmatic missing species such as the Batman River loach but also from the fantastic coverage in the mainstream media at a time when freshwater fishes are in such a great need of attention. I'm looking forward to another great year of rediscoveries and refocussed attention on these little known species that deserve to be searched for".

— Brian Zimmerman, Director of Conservation and Science, Bristol Zoological Society

2022 Highlights

Fat catfish expedition:

A Fat catfish search team will head to the mountainous Lake Tota region, northeast of Bogota, early in the year. It will consist of a group of Colombian scientists from the **Universidad Nacional de Colombia**, who will conduct eDNA assessments and surveys of the lake, and a team of sociologists, historians, anthropologists and journalists from **Ictiología y Cultura**, who will conduct a historical-cultural assessment of the lake's environs.

The more we learn about the lake, the more the mystery of the Fat catfish - and Lake Tota itself - deepens. Ictiología y Cultura's research shows that 'there is little evidence of ichthyofauna in the lake before [1940],' and all 10 specimens of the fish were recorded by one man - Cecil Miles - during a short timeframe in the mid 20th century. Where was the Fat catfish *before* then, and where has it disappeared to *after*?

Hopefully the expedition will begin to answer some of these questions.



© Mariana A. Moscoso

50 threatened flagship species report:

We will be releasing a major publication in the spring to highlight 50 threatened freshwater species, five from each taxonomic group, selected by the relevant IUCN Specialist Groups.

This will not only draw attention to the wonder of freshwater species and the threats they face, this report will be an important tool to strengthen networking between different Specialist Groups and help promote freshwater messaging across the IUCN.

Newly discovered freshwater fish report:

In March, we will release a report highlighting the newly discovered freshwater fish species of 2021. This is the first report of its kind that Shoal will release, and will become a regular feature of Shoal's work in the future.

There are more than 200 species to be included, and we will do a detailed dive into the characteristics, range, and threats of a selection.



Tanzania programme

In 2022, Shoal will start supporting activities with Sustain Lake Tanganyika to create a new protected area surrounding Nkwonde Island in the Tanzanian section of Lake Tanganyika. By the end of the year, the new reserve will be created, staff hired to permanently manage the reserve and a no-go zone created to protect the fish populations from overfishing and to provide a refuge to support breeding and population recovery.

Amazon Research Centre

Following introductions from the aquaria industry, Shoal will be launching and strengthening a partnership with the **Amazon Research Centre for Ornamental Fish** (www.amazonresearchcenter.org/) based in Iquitos, Peru. The centre is the only research station in the world focused on studying and conserving ornamental fish. The centre has a strong local awareness-raising capacity and is presently constructing a public aquarium to engage local people and schools.

Thanks to our friends & partners

A very special thanks to Synchronicity Earth and Re:wild, our two host partners who provide financial support, staff and facilities to give Shoal a strong platform from which to reach its goals. Without these two organisations, Shoal would not exist.



Special thanks to Plus Fish Philanthropy and private donors for their continued support and tireless engagement.

Thank you also to those many partners and supporters that worked with Shoal during 2021 to help us in our mission to end the extinction of freshwater species.

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| Aaron Koning | Ivan Mikolji | Parosphromenus Project |
| Alliance for Freshwater Life | James Hardcastle | Porini Foundation |
| Andy Patel | Jeremy Shelton | Ruth McDonald |
| Brian Zimmerman | Dr. Jörg Freyhof | Stefan Hetz |
| Carlos Donascimiento | Jose Ivan Mojica Corzo | Stiftung Artenschutz |
| Charles Fusari | Kerala University for Fisheries and Oceans Studies | Sustainable Eel Group |
| Chester Zoo | Lost Fishes Art Challenge entrants | The Ernest Kleinwort Charitable Trust |
| Christel Kasselmann | Mahseer Trust | The Nature Conservancy Africa |
| Conservation International | Mandai Nature | Dr Tim Lyons |
| Conservation Optimism | Matthew L. Miller | Dr. Topiltzin Contreras |
| Dr Cüneyt Kaya | Matt Spencer | Universiti Malaysia Terengganu |
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| iNaturalist | OFI | |
| IUCN Asian Species Action Partnership (ASAP) | Oxford University Museum of Natural History | |
| IUCN Freshwater Biodiversity Unit | | |
| IUCN Freshwater Fish Specialist Group | | |

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