



# 1,000 Fishes

*A Blueprint for Accelerated Conservation Action for 1,000 Freshwater Fishes by 2035*





# Our Invitation: Join the Shoal

*A message from the hosts of the SHOAL initiative and partnership: Adam and Jessica Sweidan, and Catherine Bryan of Synchronicity Earth, and Wes Sechrest and Barney Long of Re:wild, as well as the IUCN Freshwater Biodiversity Unit, IUCN Freshwater Fish Specialist Group, and all the other existing SHOAL partners.*



Recognizing a crisis is an opportunity to act, a chance to change the trajectory of a story towards a better outcome. It is not the time for inaction or apathy, or to hope that things can improve on their own. It is not the time for small, isolated actions. Only by assertive, strategic, collective action, with a strong team of allies, can major crises be averted.

## For freshwaters, the time for action is now.

The global biodiversity crisis is most acute in freshwaters. With one in four freshwater fish species threatened with extinction, they are among the most at-risk vertebrate groups worldwide.

Freshwater ecosystems connect us all: whether you live in the forests of Borneo, the deserts of Mexico or any major city, fresh water and freshwater habitats are essential for life. Fresh water is vital for agriculture, industry, recreation, sanitation and of course for drinking. Furthermore, although it covers just 1% of the planet's surface, fresh water hosts nearly 30% of all vertebrates and over half of all known fish species. Freshwater ecosystems are also special places that have important cultural or spiritual values, and many of us care deeply about a particular river, stream, lake or wetland where we spend time and have formed a connection to the place and the species that make it so important.

Yet we have allowed the world's precious rivers, lakes and wetlands to be damaged, polluted, disregarded,

and destroyed. We have treated them as resources to exploit for so long that we have lost more than 35% of wetlands since 1970, three times the rate of loss of forests. Since 1970, there has been an average decline of 84% in freshwater species populations, and at least 82 freshwater fish species have gone extinct since the early 20th century. Species that live under the water's surface, hidden from view, have been overlooked and neglected, allowed to slide towards oblivion.

While the effort to conserve freshwater fishes has clearly been insufficient, there have been many successes to learn from, and many people and organizations are committed to bringing about change. For example, the Tequila Splitfin of Mexico became Extinct In The Wild, but through an international collaboration of scientists, zoos, hobbyists, and most importantly a highly mobilized local community, it was reintroduced and the species is successfully recovering in the wild. The Tequila Splitfin is now an icon for achieving impactful freshwater fish conservation.

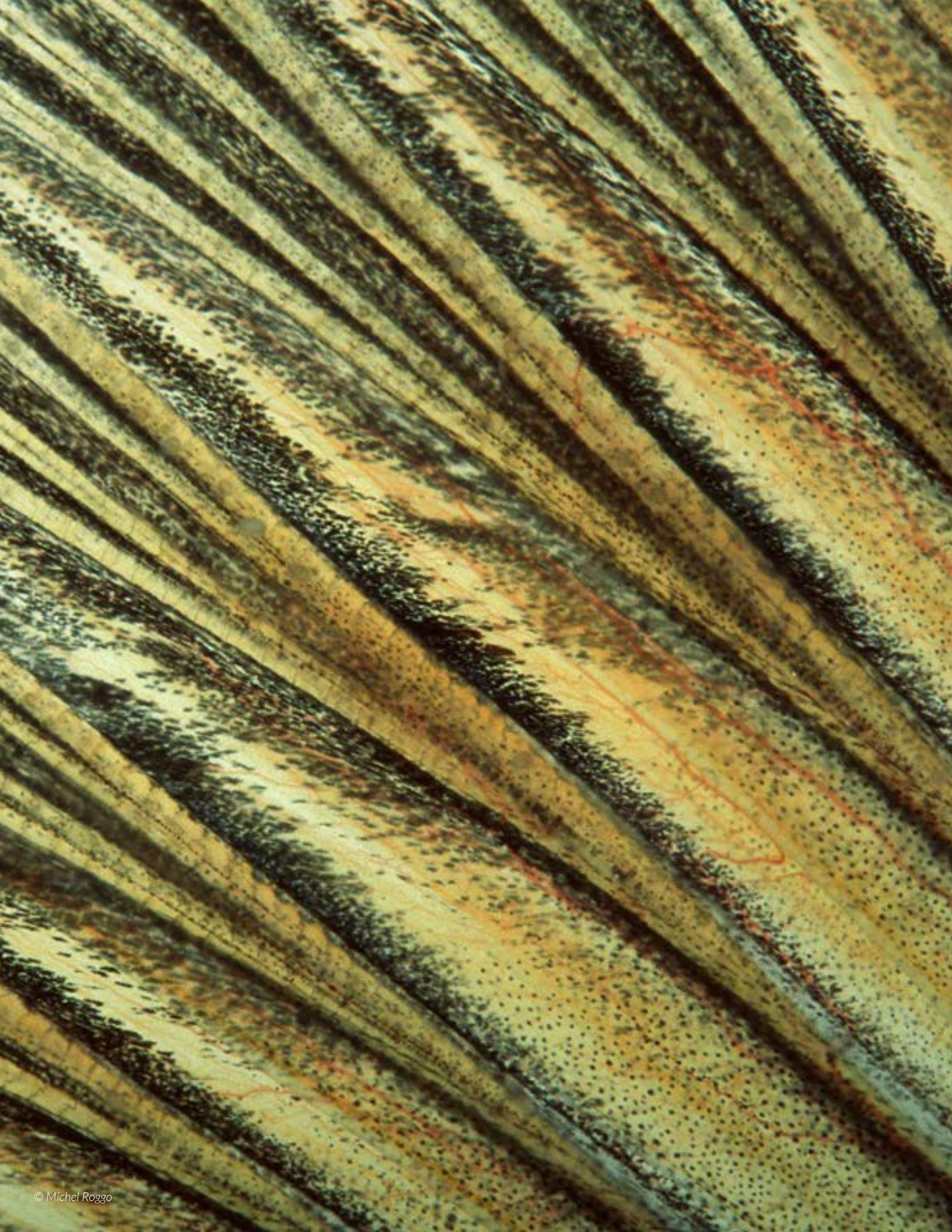
It is now time to build on the good work that has already been done by governments, conservation organizations, individuals, and communities. We need to grab this opportunity to act together to accelerate and escalate urgent action worldwide to make up for the time lost and mend the damage caused by decades of neglect.

The Blueprint for Accelerated Conservation Action for 1,000 Freshwater Fishes by 2035 identifies freshwater fish conservation priorities and efficiencies to mobilize partnerships and investments designed to drive immediate large-scale action and impact. The Blueprint is founded on an ambitious measurable goal: to mobilize urgent, accelerated action for 1,000 highly threatened species of freshwater fish by 2035.

While ambitious, this goal is also realistic. Of the 18,688 freshwater fish that have been described (on average roughly 200 new species are described each year), 3,086 are categorized as threatened and a further 2,643 are so poorly understood they are categorized as Data



*SHOAL is a program 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 registered U.S. 501(c)(3) public charity (Tax ID 26-2887967).*



Deficient on the International Union for Conservation of Nature (IUCN) Red List of Threatened Species. Out of all threatened and Extinct In The Wild species, SHOAL has selected 2,338, using the latest IUCN Red List data, as being the most in need of urgent conservation action. These are the SHOAL Priority Fishes, and the focus of the SHOAL 1,000 Fishes Initiative. Through detailed analysis, this Blueprint outlines a strategy to target conservation action for these species in the most efficient and effective way possible.

Our theory of change is based on the concept of SHOAL's global network of Strategic Partners being able to leverage change and support action, and Local Action Partners being responsible for implementing change on the frontlines. The theory is further founded on three fundamental approaches: to act directly for each priority species, to base all decisions on the best science and knowledge, and to act locally. Local solutions by local stakeholders, supported by the foremost experts and sufficient investment, will provide maximum sustained impact. However, tackling the challenge species by species, and local partner by local partner is not efficient. The final part of the theory of change is to find efficiencies of scale by tackling more species through fewer targeted actions, and by leveraging the power of Strategic Partners.

The Blueprint sets out a plan for how a significant collaborative conservation effort focusing on action for freshwater fishes could be deployed for global conservation impact. This global collaborative, given the right investment and intensity of support, will lift freshwater fishes and potentially thousands of other neglected freshwater species to a new elevated platform of conservation attention and in doing so greatly enhance freshwater conservation efforts globally. This is not a plan just for 1,000 fishes. It is a plan for hundreds of critical freshwater habitats, vital to thousands of other species and human communities, often the poorest on the planet, that rely on fresh water habitats. This plan that will demonstrate that by working together, we can achieve global change in a relatively short period of time.

Ultimately, more than 1,000 freshwater fish species will be placed on the path to recovery by 2035. Costs of action for individual or groups of freshwater fishes are often extremely low in comparison to known spending

for some single charismatic species recovery plans. The SHOAL 1,000 Fishes Initiative offers an unmissable, cost-effective opportunity for those interested in saving many species and making a measurable impact on biodiversity conservation. It reaches into some of the most threatened landscapes on Earth and will support the development of a myriad of local initiatives that will enable communities to care for their vital freshwater systems and the species they support, while producing many wider benefits.

#### You can be part of the SHOAL as a Strategic Partner by:

-  **Providing funding to the Initiative.**
-  **Joining with a current initiative on a target species.**
-  **Working to develop initiatives on a target species.**
-  **Connecting local organizations to develop an initiative on a target species.**
-  **Offering technical support and training to Local Action Partners.**
-  **Offering communication support to tell our remarkable stories and inspire others.**

We invite everyone who wants to make a difference to be part of the SHOAL. To participate is to be part of a landmark achievement for conserving global biodiversity.

Let us show that by working together – as a strong and determined shoal – we can change the trajectory for freshwater fishes from neglect and rapid decline to demonstrable recovery. Let us demonstrate that when hundreds of local organizations are empowered, they make a global impact. Together as a single shoal we will demonstrate that collaborative conservation can save the world's freshwater ecosystems and biodiversity.

# The Blueprint: In Summary

Of the 14,898 freshwater fish species assessed to date, 3,086 are categorized as threatened and a further 2,643 are categorized as Data Deficient by the IUCN Red List. SHOAL has selected 2,338 species as the most in need of urgent conservation action. They include species categorized as Extinct In The Wild, Critically Endangered, Endangered, and Vulnerable species that meet either criteria D1 (low number of mature individuals) or D2 (limited distribution with a credible future threat that could cause a rapid decline to Critically Endangered or Extinct In The Wild). These are the SHOAL Priority Fishes, and the focus of the SHOAL Initiative.

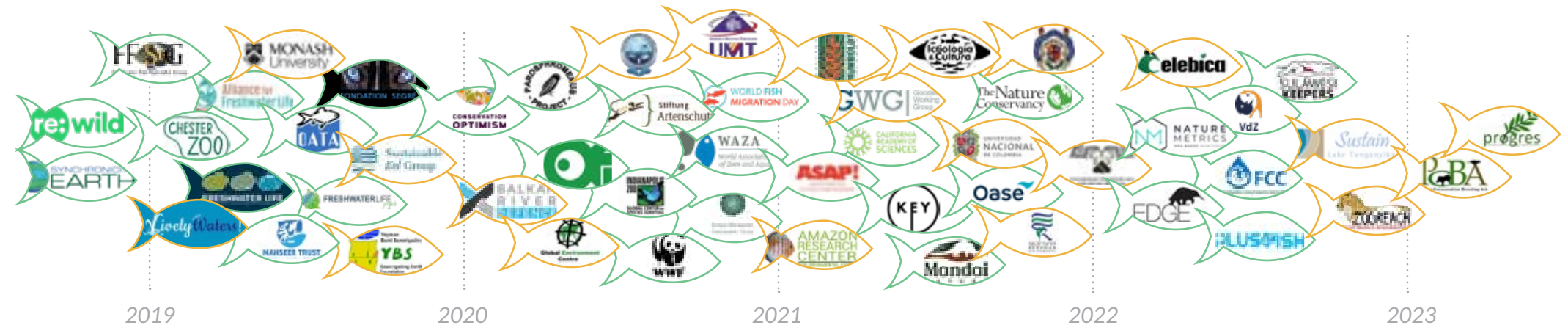
The goal of the SHOAL 1,000 Fishes Initiative is to ensure at least 1,000 of the world's most threatened freshwater fish species are receiving conservation attention by 2035.

## Our analysis shows:

- Most highly threatened freshwater species are restricted to small areas, with 86% of the Priority Fishes considered to be range-restricted.
- Only 12% of Priority Fishes currently receive direct conservation attention, much of which is very limited.
- SHOAL Priority Fishes are concentrated in a few geographic areas, with 20 countries supporting 74% of all Priority Fishes.
- There are strong opportunities for applying economies of scale. Many species do not require significant conservation resources for their recovery, and conservation attention for many Priority Fishes can be applied in parallel by focusing on specific genera, habitats and areas.
- Local action is fundamental. However, suitable local partners are rare and many do not have the resources to act.
- There are existing organizations and institutions that are willing and well placed to work together on this challenge. By bringing together their collective skills, resources and influence, change can be fast and widespread.
- Freshwater fishes rely on many of the most threatened freshwater habitats vital for people. By protecting and restoring these neglected species and their habitats, perhaps thousands of species and a multitude of communities will be positively affected.

## The SHOAL Approach

SHOAL is founded first and foremost on the concept of building a powerful collective for change – a global network of **Strategic Partners** able to leverage change and support action through **Local Action Partners** responsible for implementing the change at the frontline. The stronger the network, the stronger the SHOAL.



The 1,000 Fishes Initiative is founded on three approaches: to act as directly as possible for each Priority Fish, to base all decisions on the best science and knowledge, and to act as locally as possible. However, tackling the challenge species by species, local partner by local partner is not efficient. To recover 1,000 Priority Fishes, efficiencies of scale will be found by tackling more species through fewer, well designed and targeted programs and by using the global leverage of the SHOAL.

## The Seven Blueprint Strategies

### 1. Build and strengthen the SHOAL

Build a strong and coordinated network of partners across the world with sufficient capacity to make a difference.

### 2. Identify existing and potential opportunities for Priority Fishes protection

It is essential to identify, for each of the Priority Fishes, what protection or conservation attention the species may already receive, or what types of protection and conservation actions could be achieved that are feasible and impactful.

### 3. Couple with existing essential initiatives

There are a number of key initiatives that are already ongoing and making a significant contribution to the conservation of some SHOAL Priority Fishes by tackling key themes or threats identified as priorities. As the SHOAL Initiative does not work on the larger drivers of freshwater biodiversity loss it is important that SHOAL recognizes and works in synergy with these existing initiatives and programs.

### 4. Lead ex situ conservation action

Over 13% of SHOAL Priority Fishes have been identified as requiring ex situ action, with 52% of these species being Critically Endangered. In 2024, SHOAL launched the SHOAL Alliance of Zoos and Aquaria for Freshwater Species Conservation to help catalyze the adoption of 300+ species into conservation breeding programs with the ultimate aim of supporting recovery programs in the wild.

### 5. Engaging hobbyist, angling and fisheries interests

There is already a very large constituency that is concerned with freshwater fishes, such as those engaged in subsistence and commercial fisheries, the millions of people that keep fish as pets, and those who visit fresh waters to undertake one of the world's most popular hobbies, angling. SHOAL will harness the power and commitment of these interest groups to drive freshwater fish conservation efforts across the world.

### 6. Deal with Data Deficient and unevaluated species

With more than 6,000 freshwater fish species either categorized as Data Deficient or having not yet been evaluated by the IUCN Red List, there may be a significant number of additional species that should be on the SHOAL Priority Fishes list. It is likely that many of these species would be considered threatened if sufficient information was available or they underwent an assessment for the IUCN Red List. This knowledge gap cannot be ignored and action is required to improve the information available and enable the assessment of more species.

### 7. Focus on priorities to maximize economies of scale

The heart of the Blueprint sets out a series of geographic, taxonomic and habitat-defined priorities, identified through the analysis, that if sufficiently resourced with funding and partner expertise, would propel the Initiative towards its goal as fast as possible by applying economies of scale.

See these in detail (pg 22)

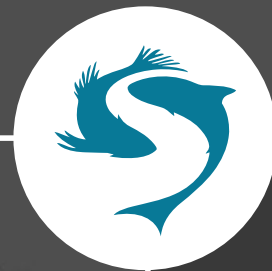
# Geographic Priorities

## 36 Priority Countries



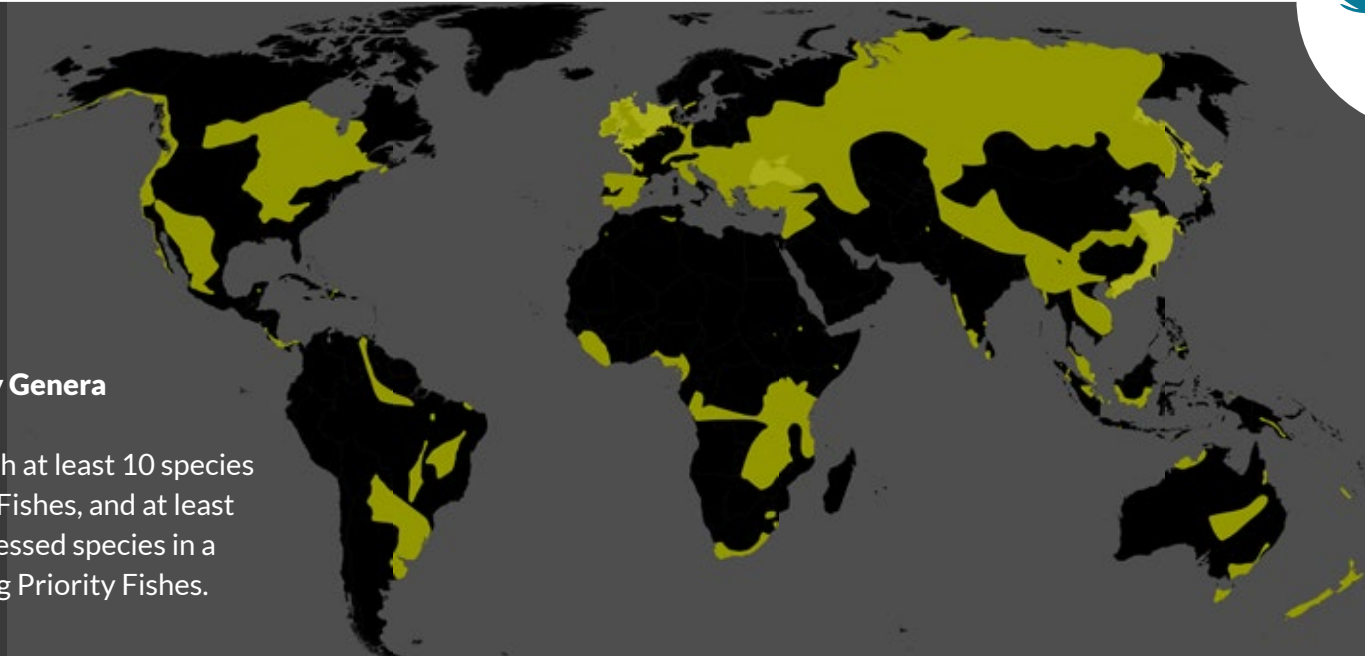
Priority Countries  
*With the most priority species, from high to low*

These countries will form the primary structure for prioritizing implementation. Thirty countries have high numbers of Data Deficient species.



## 39 Priority Genera

Genera with at least 10 species of Priority Fishes, and at least 25% of assessed species in a genus being Priority Fishes.



## 37 Priority Areas

Areas with high species richness of Priority Fishes. There are four Priority Habitats, including 51 priority lakes and nine rivers.



# Changing the trajectory for freshwater fishes

Fresh water is arguably the most important resource for all non-marine life on our planet. As the human population grows, our global footprint grows, impacts of climate change increase, and the demands on fresh water and freshwater habitats expand. Because of these pressures, along with more immediate impacts like pollution and dams, freshwater biodiversity could be facing a bleak future (Dudgeon, 2019).

Freshwater fishes are one of the most neglected and overlooked groups of vertebrates on the planet when it comes to conservation. As a consequence, there has previously been poor representation of this group on the IUCN Red List compared to other vertebrates. However, in December of 2023 IUCN reached its goal of assessing at least 80% of all freshwater fishes.

A total of 18,688 freshwater fish species had been described by science as of 5 February 2024 (Fricke et al. 2024). By the end of 2023, 14,898 species had been assessed for the IUCN Red List (IUCN 2023).

**The IUCN global freshwater fish assessment found that 25% of freshwater fishes are threatened with extinction.**

On the Blueprint's publication date, there were 730 species categorized as Critically Endangered, 1,143 categorized as Endangered, and 1,213 species categorized as Vulnerable. An additional 18% of the freshwater fishes (2,643 species) that have been assessed for the IUCN Red List were categorized as Data Deficient, meaning there was insufficient information to accurately assess their extinction risk. Assuming a similar proportion of Data Deficient species are threatened as those that had sufficient information available to be categorized as threatened, an additional 661 Data Deficient species would be considered at risk. If 25% of the species that have not been evaluated are likely to be threatened, an additional 948 species are in dire need of conservation action. If these proportions of likely threatened Data Deficient and non-evaluated species were added to the tally of species categorized as threatened by the IUCN Red List, the percentage of freshwater fishes that are threatened with extinction would climb to 42%.

At present, the operational capacity and available funding to reverse or even halt further declines of freshwater fishes across the globe is severely lacking. A significant increase in investment is needed to provide the resources, capacity building, local organizational development, and support for ex situ breeding needed to reach the levels of action necessary for achieving impact at the scale needed. Despite the fact that populations of freshwater vertebrates are declining faster than those of marine or terrestrial species, freshwater systems receive only about 3.2% of the environmental funding provided by European foundations. (Cracknell et al., 2016).

## Our Goal

Recognizing that a seismic-level shift in effort is required, an ambitious and well-defined goal has been set.

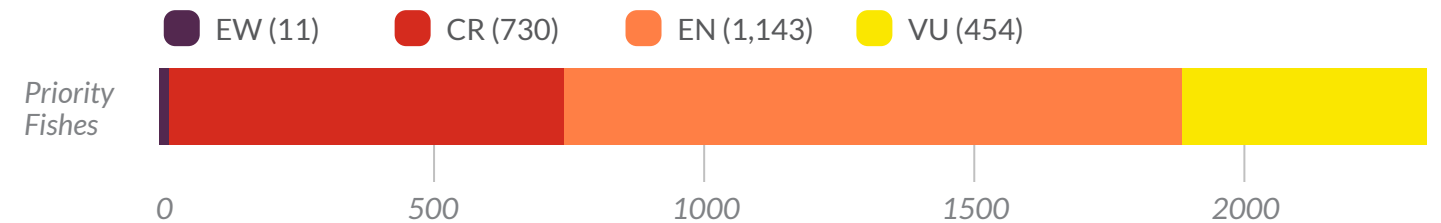
### SHOAL Priority Fishes

2,338

- 100% Action on the remaining 1,338 Priority Fishes will be catalyzed by this initial concentrated focus on 1,000.
- 75% To reach the 1,000 target, we need to catalyze actions for an additional 712 species over the next nine years (assuming present actions are maintained). These figures are based on comments under each species' assessment for the IUCN Red List.
- 50% Currently only 288 species out of the 2,338 SHOAL Priority Fishes have some type of conservation action in place.
- 25%

### Why 1,000 species of freshwater fish?

With input from the IUCN SSC Freshwater Fish Specialist Group (IUCN SSC FFSG), SHOAL has created a list of fishes most in need of conservation action: the SHOAL Priority Fishes. This list includes all fishes categorized by the IUCN Red List as Extinct In The Wild (EW), Critically Endangered (CR), Endangered (EN), and Vulnerable (VU) species that meet either one of two criteria: 1) species with a low number of mature individuals, and 2) species with restricted areas of occupancy or number of locations with a likely future threat that may cause the species to become CR or EW within a short period (IUCN, 2012).



The figure of 1,000 species has been carefully considered. The target needs to be inspiring enough to mobilize action as urgency, collaboration, and innovation are all required to change the trajectory of taxon from decline to recovery. However, the target also needs to be achievable. One thousand species is a realistic balance between ambition and pragmatism. After decades of neglect, this target provides freshwater fish a chance to catch up to other taxa in terms of conservation investment. It will propel this unique group towards wide scale improvement in status of both species and habitats.

**By 2035**

**1,000**

of the **most threatened** freshwater fish species  
*a selection of the 2,338 SHOAL Priority Fishes*

will be receiving sufficient conservation attention to ensure the species are no longer heading towards extinction, and the potential for recovery exists.

# Why it is important to conserve freshwater fishes?

Freshwater fish represent a substantial proportion (25%) of vertebrate biodiversity (WWF, 2020), more than half of all known fish species occupy freshwaters, and they are also a highly threatened group (25% of species) (IUCN, 2023). By working to conserve them, it's possible to save a meaningful proportion of Earth's threatened vertebrate biodiversity.

Freshwater fishes can be excellent ambassadors for conservation. The vast majority of human settlements are near freshwaters, and we are innately connected to these systems. These rivers, lakes, wetlands, ponds, and other habitats support many important aspects of human health, well-being, and culture in our lives (Völker & Kistemann, 2011). Additionally, many species of freshwater fish can serve as compelling examples of the benefits of conservation actions in a relatively short period of time, as recovery can be rapidly successful for certain species when the right conditions are put in place.

At least 200 million people around the world rely on small-scale freshwater fisheries, and the total annual value of inland fisheries is estimated to be USD 38 billion (Hughes, 2021). Conserving threatened species that are still targeted in fisheries can provide both socioeconomic and biodiversity benefits.

Freshwater fishes are commonly used as indicator species to evaluate ecosystem health, as the status of certain species is often closely associated with the state of the water bodies they inhabit (Munkittrick & Dixon, 1989). Native fishes will thrive when the systems they inhabit are healthy, so taking actions to recover a target species typically leads to additional ecological and biodiversity benefits for their ecosystems and for multiple co-occurring species.

Despite the fact that biodiversity in freshwater habitats is declining two to three times faster than in marine or terrestrial habitats (Birnie-Gauvin et al., 2023), they have to date received relatively little conservation attention or funding compared to other groups.

## Priority Fishes : Primary Threats

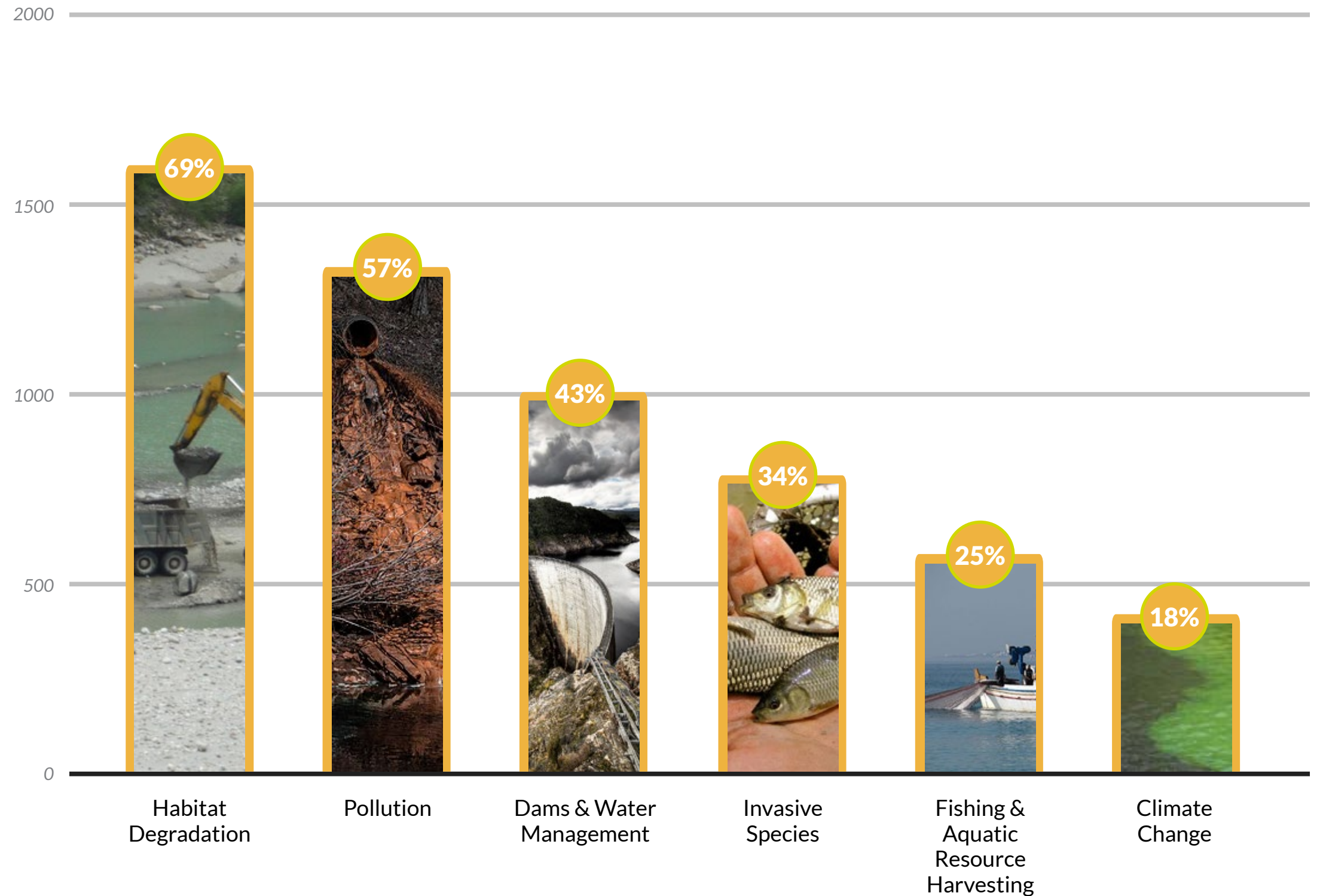


Photo credits, left to right: © Samir Mehta/International Rivers, © Wikimedia, © Wikimedia, © UNSW, and © Getty.

# The SHOAL Blueprint

The Blueprint represents the most cost-effective and targeted investment plan, based on a thorough analysis of data on Priority Species, to initiate conservation action at scale for freshwater fishes. The goal of SHOAL is to escalate, accelerate and sustain action for all threatened freshwater fishes. The SHOAL 1,000 Fishes Initiative is designed to contribute to that goal with the Blueprint providing a roadmap to place at least 1,000 species under conservation action by 2035. Additionally, this focus on freshwater fish will act as a surrogate, representing all overlooked and neglected freshwater species and habitats.

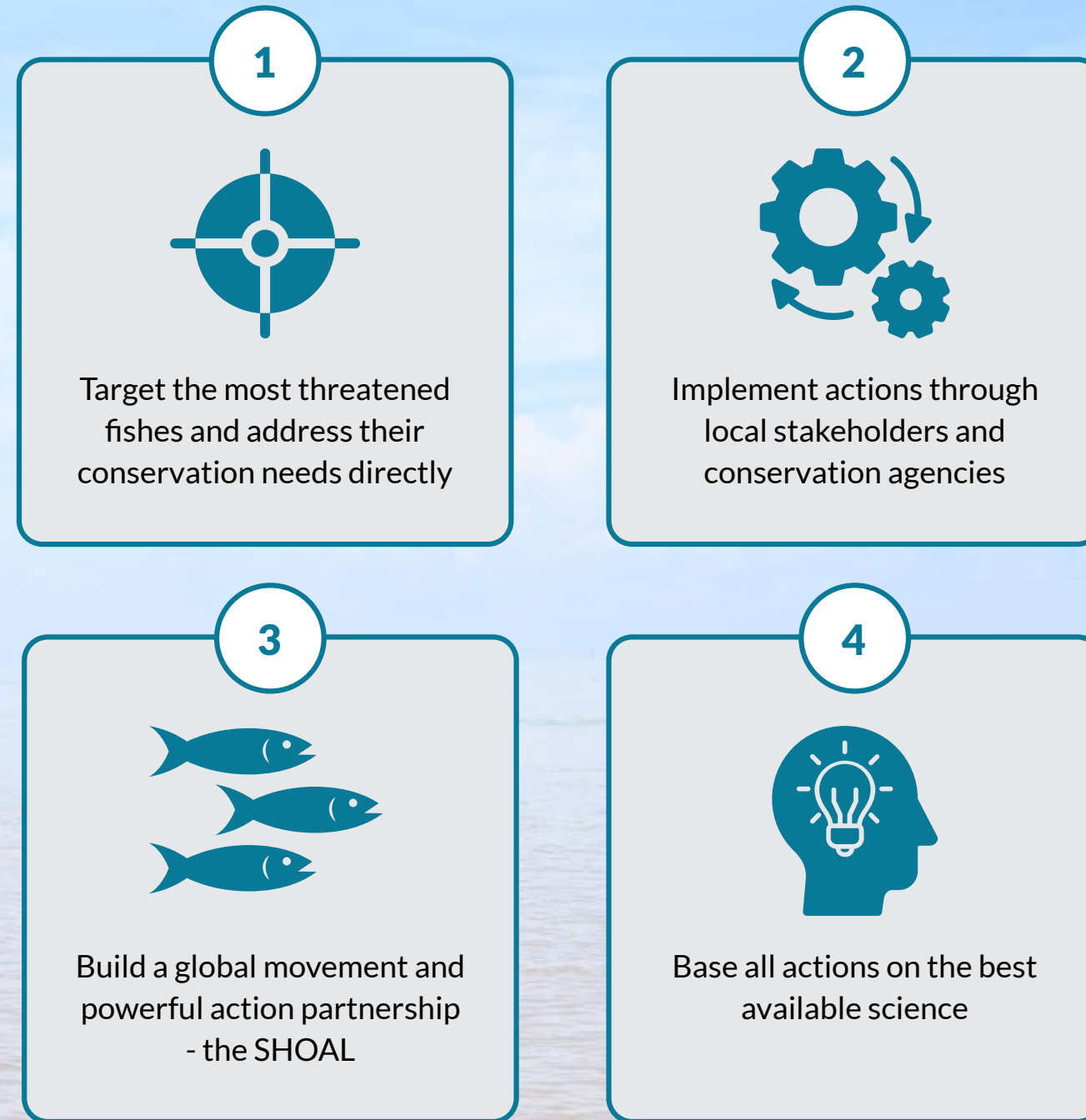
One advantage of freshwater species conservation being overlooked for so long, is that we can build off lessons learned from previous decades of species conservation.

There are hundreds, if not thousands, of examples of successful efforts to recover or stabilize threatened species via directly targeted action. However, more recently it has become common to work using larger scale, systems-based approaches that are often more efficient and comprehensive for managing whole ecosystems. The systems-based approach is vital and valid. By tackling the system as a whole or by focusing even deeper on the root causes of biodiversity loss, solutions can be applied at scale. However, this approach is not always efficient when measured by the number of threatened species that have been saved from further population declines. Many species often fall through the cracks. These species then are left with no resources for their conservation as support directly targeting species has been redirected to the costs of larger scale system change. As a result, many species remain threatened with extinction. A balance between these approaches is required to stop species from falling into decline.

SHOAL believes that the best approach to dealing with the rapid decline of most freshwater fishes and transforming neglect to attention is to target species directly, acting locally and efficiently. At this scale, efforts can be very cost effective and sustained by the capacity, passion and commitment of local stakeholders. Recovery is possible for a majority of fishes because most threatened species require small-scale, direct interventions that can be led by local organizations if they are given sufficient technical and financial support.

## The Approach

The Approach can be summarized through four fundamental methods:



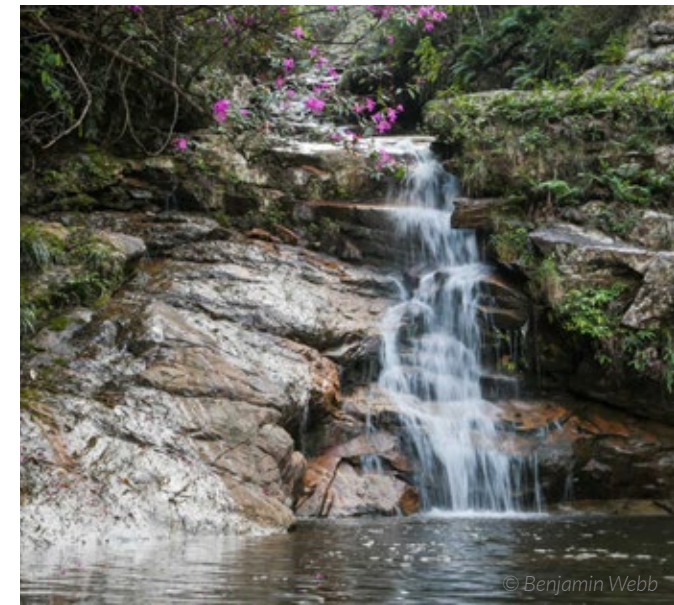
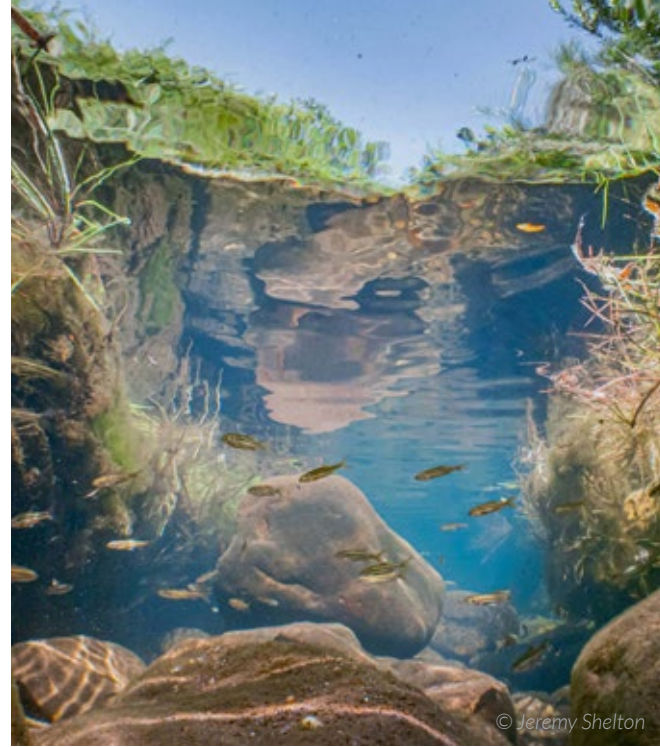
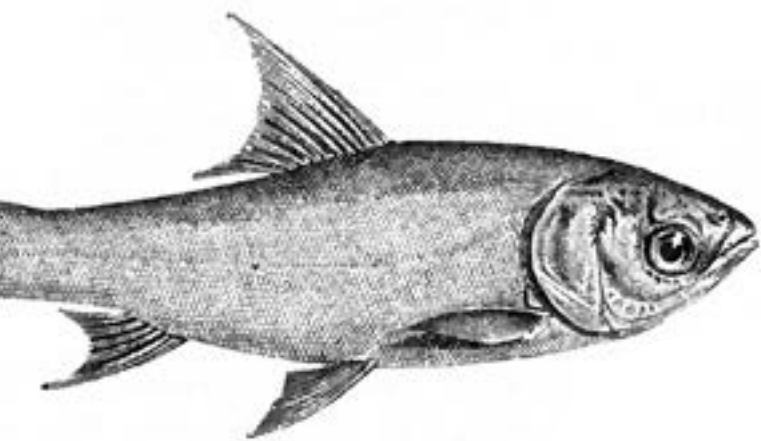
The foundation for the Blueprint is the IUCN Red List. This incredibly valuable compilation of data and information for 80% of the world's freshwater fishes has been analyzed and queried in a way it has never been for freshwater fishes.

# The SHOAL Initiative so far

The SHOAL Initiative was launched in March 2019 as a global partnership to scale up freshwater biodiversity conservation. Synchronicity Earth and Re:wild agreed to host the Initiative by providing funding, administrative support and a home for the staff and projects of the Initiative. Since its launch the Initiative has established projects for threatened species in five continents, has managed a fund for small grants in Southeast Asia (together with the IUCN SSC Asian Species Action Partnership (ASAP)), developed two strategies for multi-species fish conservation programs, built a network of Strategic and Local Action Partners, created the Freshwater Inspire Network, launched the SHOAL Zoo and Aquaria Alliance for Freshwater Species Conservation and created the first global platform for the home aquaria hobby to support conservation action for freshwater fishes.

Typically SHOAL mobilizes Strategic Partners to provide financial and technical support to Local Action Partners to initiate rapid efforts directly targeting one or more threatened species and their habitats. Additionally, we promote engagement in the protection and recovery of local freshwater ecosystems vital for local economies and the wellbeing of some of the poorest communities in the world.

For example, in 2019 SHOAL, together with Re:wild and Synchronicity Earth, supported three Local Action Partners (Yayasan Bumi Saweridaging, Progres, and Celebica), by bringing in funds from the IUCN SSC ASAP program, the Ernest Kleinwort Charitable Trust and other anonymous donors, to begin a program of action for the highly threatened endemic community of fishes in the ancient lakes of Sulawesi.



**The Tequila Splitfin**  
*Zoogoneticus tequila*

This endemic species of Mexico became Extinct In The Wild in 2003. After dedicated work to breed a healthy captive population and address threats in suitable wild habitat, nearly 20 years later it was successfully reintroduced to the wild and is now on the road to recovery thanks to efforts led by the Laboratory of Aquatic Biology of the Universidad Michoacana de San Nicolás de Hidalgo and the Fish Ark Mexico Project, together with many partners including Chester Zoo in the U.K. and local communities. The story is considered a great success among freshwater fish conservation efforts, and serves as an example of the potential for international and local collaboration to recover a species that was nearly lost from its native home for good.



# The SHOAL Priority Fishes

## An analysis

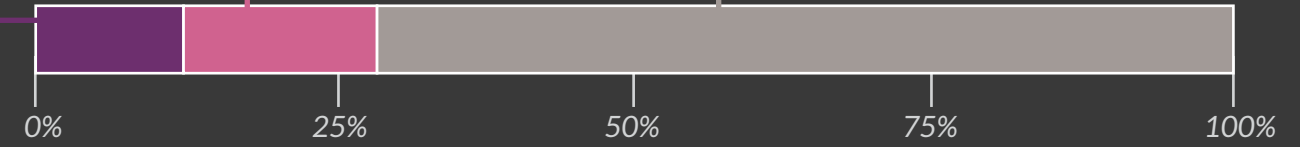
# Distribution of the SHOAL Priority Fishes

The Priority Fishes occur in a total of 198 countries. Though the majority of countries host only a small number of species, there are 32 countries with a minimum of 25 species each. The species counts for the “Top 20” countries with the highest numbers of Priority Fishes range from 39 up to 263 species.

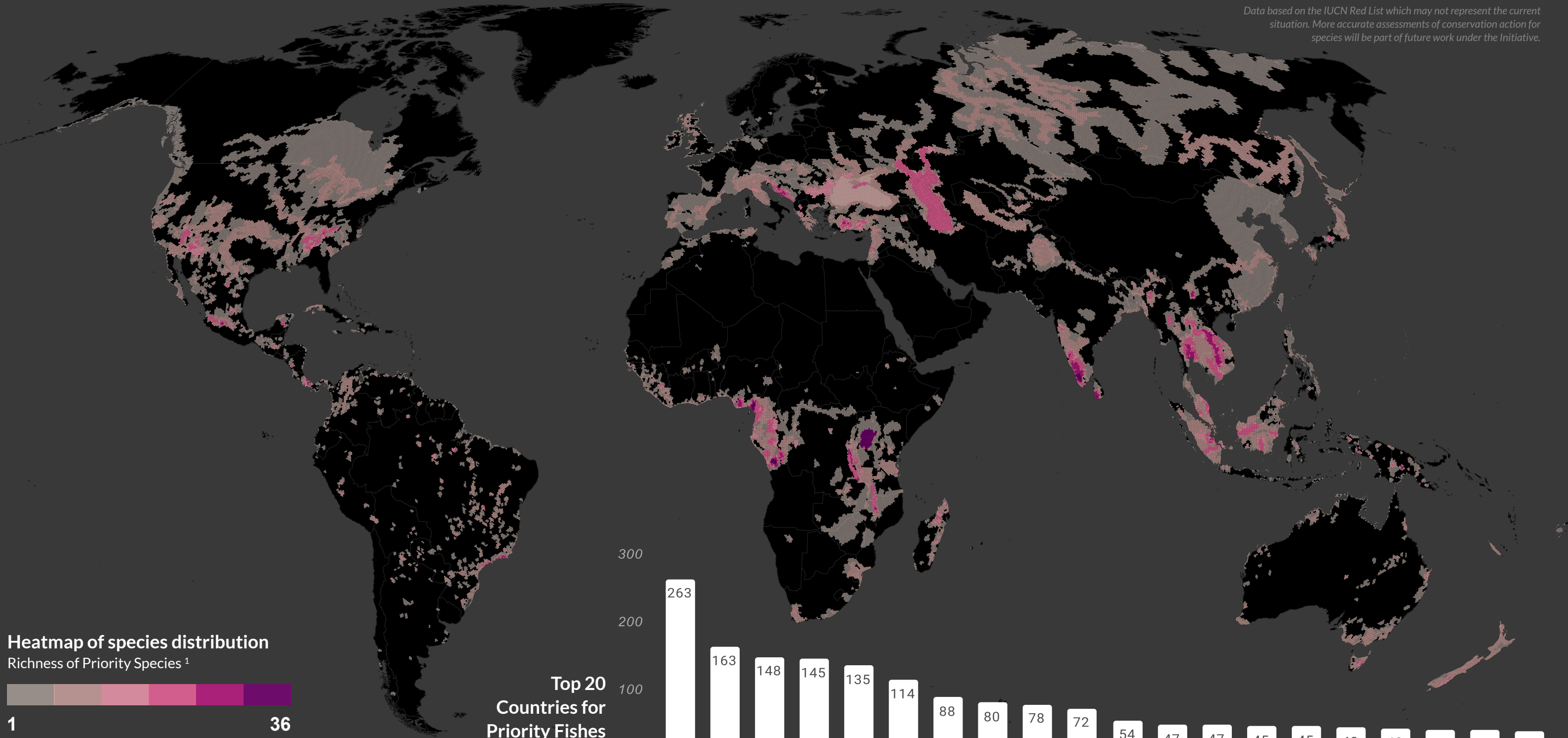
Only 288 Priority Fishes are presently considered to be receiving conservation attention.

378 have some conservation attention but not enough to halt declines or support recovery.

1,672 species are not receiving attention, and face further declines and extinctions unless actions are taken in the near term.



Data based on the IUCN Red List which may not represent the current situation. More accurate assessments of conservation action for species will be part of future work under the Initiative.



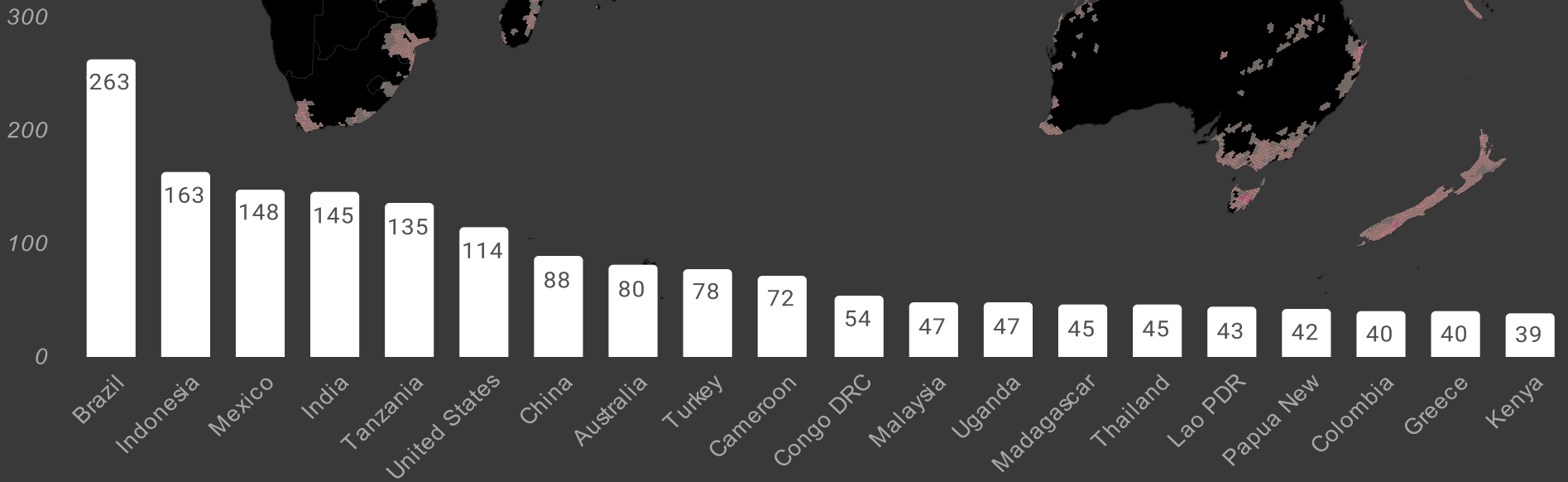
## Heatmap of species distribution

Richness of Priority Species <sup>1</sup>



## Top 20 Countries for Priority Fishes

Species Count

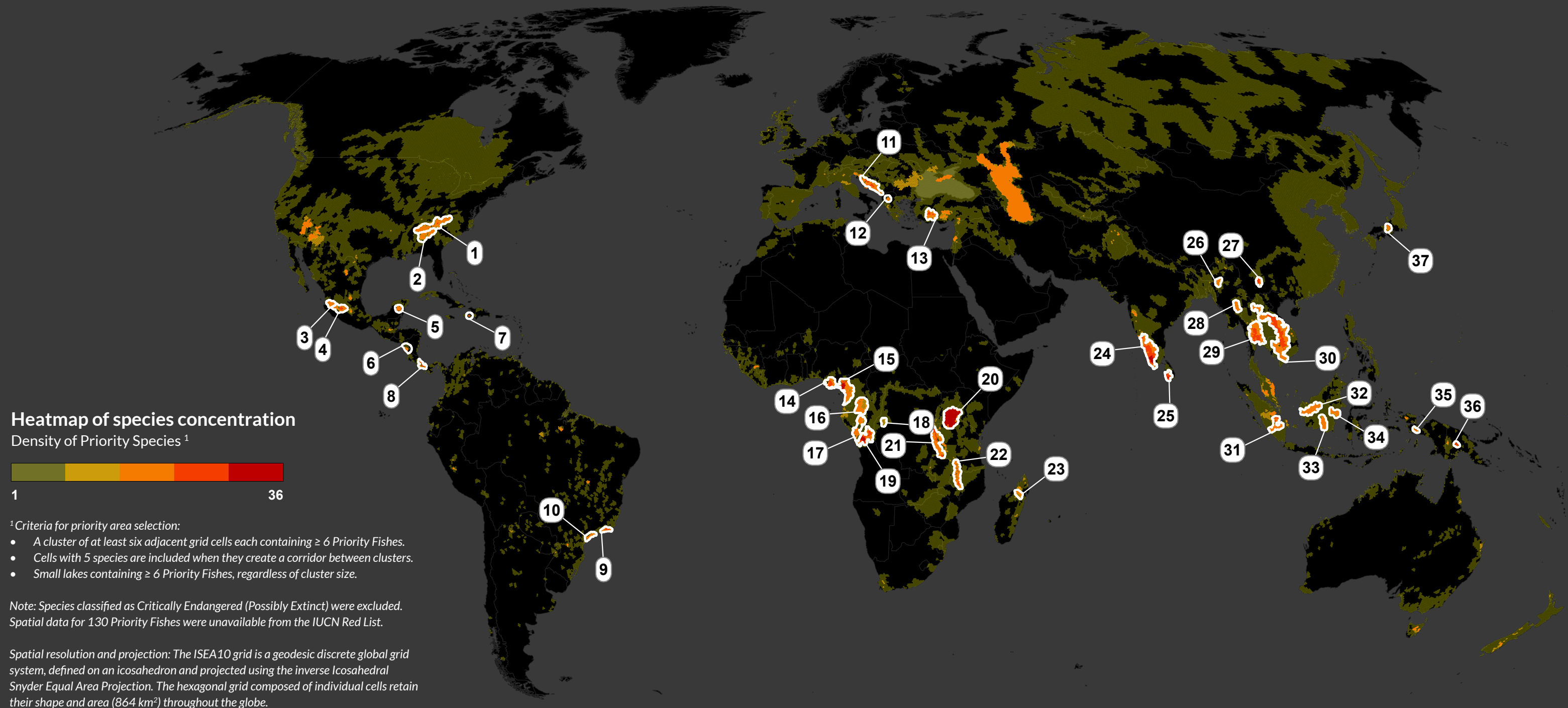


<sup>1</sup> 130 of the SHOAL Priority Fishes are not mapped here, as these species did not have accessible spatial data and Critically Endangered (Possibly Extinct) species were also excluded.

# Priority Areas: Areas of high concentration of SHOAL Priority Fishes

We identified Priority Areas with high concentrations of SHOAL Priority Fishes by using available spatial data from the IUCN Red List. Designing programs and partnerships focused on Priority Areas will help increase the efficiency and impact of investments, as these programs will target multiple species simultaneously. The 37 Priority Areas identified contain a total of 627 SHOAL Priority Fishes that have at least 70% of their range covered by a Priority Area. Where appropriate, the names of the Priority Areas are based on the Freshwater Ecoregions of the World they are most closely associated with (Abell et al., 2008).

- |                            |  |                             |                            |
|----------------------------|--|-----------------------------|----------------------------|
| 1. Cumberland-Tennessee    | 11. Dalmatian Coast                              | 19. Lower Congo             | 29. Chao Phraya-Mae Khlong |
| 2. East Gulf Coastal Plain | 12. Ohrid-Prespa Lakes                           | 20. Lake Victoria           | 30. Mekong                 |
| 3. Ameca - Manantlan       | 13. Central Anatolia                             | 21. Lake Tanganyika         | 31. Southern Sumatra       |
| 4. Lerma-Chapala           | 14. Niger Delta                                  | 22. Lake Malawi             | 32. Western Borneo-Kapuas  |
| 5. Lake Chichancanab       | 15. W. Eq. Crater Lakes-Gulf of Guinea Drainages | 23. Northwestern Madagascar | 33. Southeastern Borneo    |
| 6. Nicaraguan Crater Lakes | 16. S. Gulf of Guinea Drainages                  | 24. Western Ghats           | 34. Eastern Borneo         |
| 7. Lake Miragoâne          | 17. Ogooue - Nyanga - Kouilou - Niari            | 25. Sri Lanka Wet Zone      | 35. West Papua             |
| 8. Isthmus Caribbean       | 18. Mai-Ndombe                                   | 26. Chin Hills              | 36. Lake Kutubu            |
| 9. Fluminense Lowlands     |  | 27. Yunnan Lakes            | 37. Lake Biwa              |
| 10. Ribeira de Iguape      |  | 28. Inle Lake-Salween       |                            |



# Priority Genera: in detail

There are some genera with high numbers of species on the Priority Fishes list and with at least 25% of the assessed species in the genus being Priority Fishes. Species within a genus may have similar conservation and management needs, are often distributed in the same region of the planet, and frequently have dedicated interest groups and scientists associated with them. By focusing on the Priority Genera, conservation efforts can be designed more efficiently and scaled up through local partnerships. Initiatives and networks targeting all the Priority Fishes in a particular genus can provide a means of uniting experts and actors at various levels to escalate the pace of action.

Thirty-nine Priority Genera were identified with a minimum number of 10 species on the Priority Fishes list and where at least 25% of all assessed species in the genus are Priority Fishes. These 39 genera are represented by 786 Priority Fishes.

The Priority Genera represent a wide range of taxonomies and ecologies including the *Acipenser* (sturgeon) and the annual killifish genus *Austrolebias* of South America where adults produce desiccation-resistant embryos that can survive the dry season before they all die out each year when the seasonal ponds they inhabit dry up. When the rains return and the ponds fill with water again the dormant embryos develop into adults and this next generation continues the cycle. Short summaries for each genus can be found in Annex B.

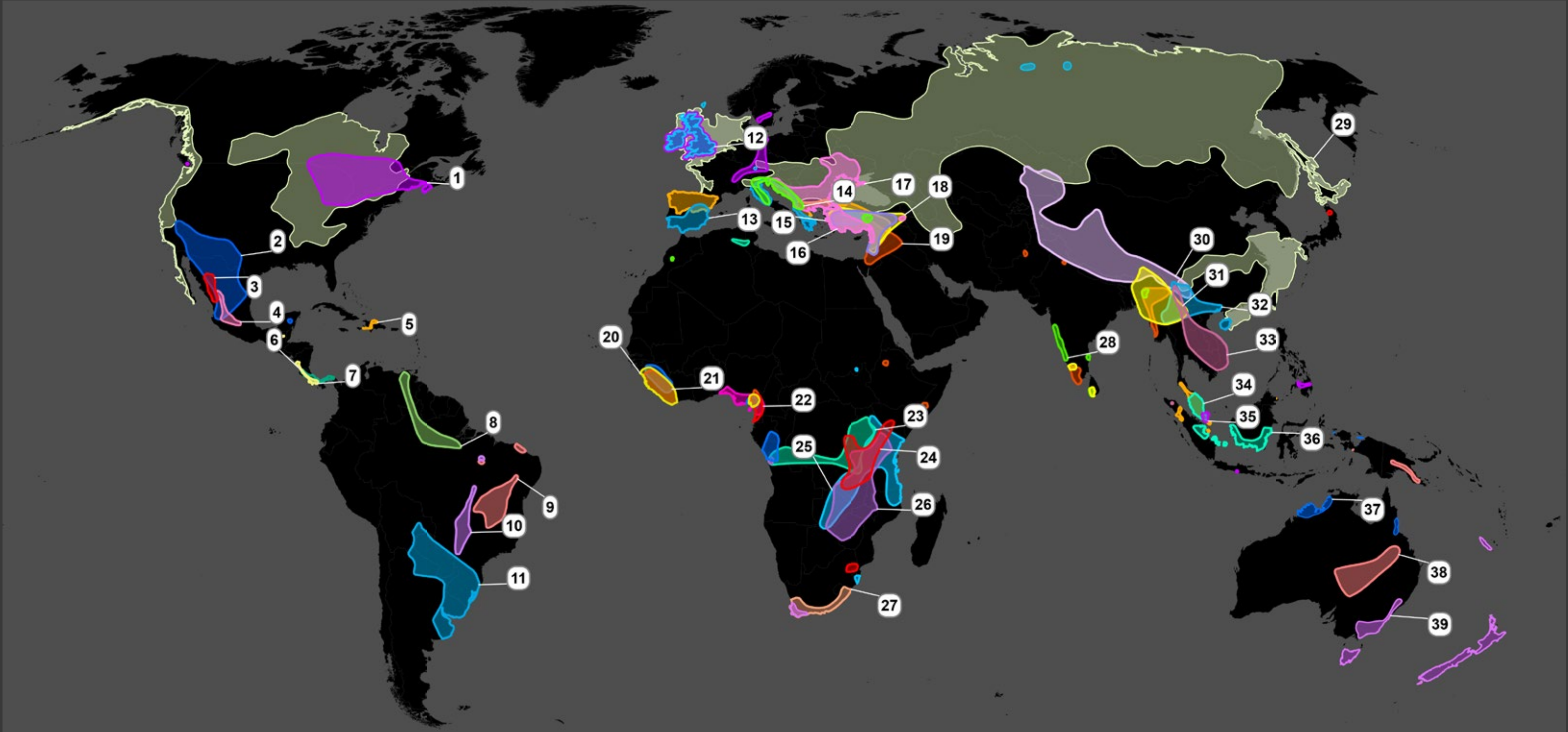
Photo credits, top to bottom: © Vassil, © Culneyt Kaya, © Wikimedia, © David Tan, © Erickson Smith, © Jörn, © YFRag, © Amorikuma, and © Klaus Rudloff.



Genus	No. priority fishes in genus	No. assessed species in genus	% priority fishes in genus
<i>Haplochromis</i>	87	231	38%
<i>Melanotaenia</i>	44	91	48%
<i>Galaxias</i>	41	57	72%
<i>Hypsolebias</i>	41	52	79%
<i>Garra</i>	32	103	31%
<i>Betta</i>	28	71	39%
<i>Cobitis</i>	27	67	40%
<i>Cyprinodon</i>	27	48	56%
<i>Nothobranchius</i>	27	96	28%
<i>Austrolebias</i>	25	34	74%
<i>Chiloglanis</i>	21	57	37%
<i>Coregonus</i>	19	61	31%
<i>Coptodon</i>	17	30	57%
<i>Pseudophoxinus</i>	17	22	77%
<i>Salmo</i>	17	38	45%
<i>Oreochromis</i>	16	34	47%
<i>Mogurnda</i>	15	27	56%
<i>Parosphromenus</i>	15	20	75%
<i>Salvelinus</i>	15	27	56%
<i>Squalius</i>	15	45	33%
<i>Acipenser</i>	14	17	82%
<i>Alburnus</i>	14	39	36%
<i>Melanorivulus</i>	14	44	32%
<i>Amphilophus</i>	13	17	76%
<i>Oncorhynchus</i>	13	18	72%
<i>Pethia</i>	13	36	36%
<i>Schizothorax</i>	12	43	28%
<i>Amphilius</i>	12	34	35%
<i>Chirostoma</i>	12	21	57%
<i>Cyprinus</i>	12	23	52%
<i>Limia</i>	12	21	57%
<i>Oxynoemacheilus</i>	12	20	60%
<i>Pseudobarbus</i>	12	17	71%
<i>Barbodes</i>	11	43	26%
<i>Devario</i>	11	40	28%
<i>Fundulopanchax</i>	11	26	42%
<i>Cynodonichthys</i>	10	23	43%
<i>Poropuntius</i>	10	32	31%
<i>Sternarchorhynchus</i>	10	31	32%

# Priority Genera

- |                          |                              |                            |                           |                         |                           |
|--------------------------|------------------------------|----------------------------|---------------------------|-------------------------|---------------------------|
| 1. <i>Coregonus</i>      | 8. <i>Sternarchorhynchus</i> | 15. <i>Cobitis</i>         | 22. <i>Fundulopanchax</i> | 29. <i>Acipenser</i>    | 36. <i>Parosphromenus</i> |
| 2. <i>Cyprinodon</i>     | 9. <i>Hypsoblebias</i>       | 16. <i>Pseudophoxinus</i>  | 23. <i>Haplochromis</i>   | 30. <i>Schizothorax</i> | 37. <i>Melanotaenia</i>   |
| 3. <i>Oncorhynchus</i>   | 10. <i>Melanorivulus</i>     | 17. <i>Alburnus</i>        | 24. <i>Chiloglanis</i>    | 31. <i>Devario</i>      | 38. <i>Mogurnda</i>       |
| 4. <i>Chirostoma</i>     | 11. <i>Austrolebias</i>      | 18. <i>Oxynoemacheilus</i> | 25. <i>Nothobranchius</i> | 32. <i>Cyprinus</i>     | 39. <i>Galaxias</i>       |
| 5. <i>Limia</i>          | 12. <i>Salvelinus</i>        | 19. <i>Garra</i>           | 26. <i>Oreochromis</i>    | 33. <i>Poropuntius</i>  |                           |
| 6. <i>Cynodonichthys</i> | 13. <i>Squalius</i>          | 20. <i>Coptodon</i>        | 27. <i>Pseudobarbus</i>   | 34. <i>Betta</i>        |                           |
| 7. <i>Amphilophus</i>    | 14. <i>Salmo</i>             | 21. <i>Amphilius</i>       | 28. <i>Pethia</i>         | 35. <i>Barbodes</i>     |                           |



# Priority Fishes with specific human interest

Nine hundred and fifty-four species (41%) are recorded in the IUCN Red List as having a specific interest to humans.

Fishes stand out as unique animals given the widespread acceptance of their use for consumption, recreational fishing, pets, or other purposes such as bait. Few other types of wild vertebrates are still viewed as utilitarian across most of our planet. In the poorest parts of the world, all fish to some extent, even the smallest species, provide a vital source of food security, protein, and micronutrients.

Despite their fragility, even some of the most threatened fish populations are targeted for human use, underscoring the critical interdependence between humans and fish.

This dynamic presents an opportunity, because while many fishes may be threatened, their value to humans can be leveraged to gain support for sustaining their populations. Given implementation of appropriate management, those species valued by humans for their usefulness can be a driver to establish extra incentives to mobilize support of their conservation among different stakeholders.



<sup>1</sup>Bycatch: the fish would be consumed but only when caught as bycatch

<sup>2</sup>Bait: where "used for bait" is specifically mentioned in the Red List profile of the species

## Data highlights

### Range-restricted species

There are 2,075 species (89% of all SHOAL Priority Fishes) that are considered as range-restricted species, meaning their distribution is limited to relatively small areas. For example, many only occur in a single lake or spring.

This characteristic of the Priority Fishes provides an opportunity. Targeted action can be applied through well designed and well supported local action. Many of the examples of successful fish conservation efforts have shown positive impact, often with very limited resources, as action was targeted and met the precise needs of each species rather than spreading resources too thinly by aiming to meet multiple objectives.

### Species requiring ex situ conservation

There are 305 species where ex situ breeding is a recommended conservation action within their assessments for the IUCN Red List. Over 52% of these species are Critically Endangered and for some creating assurance populations may be the only hope to avoid their extinction.

### Possibly Extinct species

Of the 2,338 Priority Fishes, 139 are classed as Critically Endangered - Possibly Extinct, meaning that these species are either on the verge of Extinction or may already be gone. Urgent searches for these species are required and if found, conservation actions need to be implemented immediately.

**89%**  
2,075 species

**13%**  
305 species

**6%**  
139 species



## Evolutionary Distinct and Globally Endangered fishes

The Evolutionary Distinct and Globally Endangered (EDGE) species are assessed for evolutionary uniqueness and level of endangerment, and then ranked based on their genetic distinctiveness and extinction risk, with the number one representing the highest ranking. The most highly ranked species are priorities for conservation. Many ray-finned (Actinopterygii) freshwater fishes have been ranked and the 25 SHOAL Priority Fishes with the highest EDGE ranks are presented here.

Scientific Name	IUCN Red List Category	Countries	EDGE Rank
<i>Lepidogalaxias salamandroides</i>	Endangered	Australia	1
<i>Typhleotris pauliani</i>	Critically Endangered	Madagascar	2
<i>Milyeringa justitia</i>	Critically Endangered	Australia	3
<i>Typhleotris mararybe</i>	Critically Endangered	Madagascar	4
<i>Typhleotris madagascariensis</i>	Endangered	Madagascar	6
<i>Valencia letourneuxi</i>	Critically Endangered	Albania, Greece	8
<i>Valencia hispanica</i>	Critically Endangered	Spain	9
<i>Callopanchax monroviae</i>	Critically Endangered	Liberia	10
<i>Adrianichthys kruyti</i>	Critically Endangered	Indonesia	11
<i>Kiunga bleheri</i>	Critically Endangered	Papua New Guinea	12
<i>Neochanna heleios</i>	Critically Endangered	New Zealand	13
<i>Tondanichthys kottelati</i>	Critically Endangered	Indonesia	14
<i>Scleropages formosus</i>	Endangered	Indonesia, Cambodia, Malaysia, Thailand, Viet Nam	15
<i>Scriptaphyosemion schmitti</i>	Critically Endangered	Liberia	16
<i>Neochanna cleaveri</i>	Endangered	Australia	17
<i>Galaxias rostratus</i>	Critically Endangered	Australia	18
<i>Betta miniopinna</i>	Critically Endangered	Indonesia	20
<i>Parosphromenus alfredi</i>	Critically Endangered	Malaysia	21
<i>Epalzeorhynchus bicolor</i>	Critically Endangered	Thailand	22
<i>Acipenser sturio</i>	Critically Endangered	France	23
<i>Cairnsichthys rhombosomoides</i>	Endangered	Australia	24
<i>Ophthalmolebias constanciae</i> ( <i>Simpsonichthys constanciae</i> )	Critically Endangered	Brazil	25
<i>Galaxiella pusilla</i>	Endangered	Australia	27
<i>Oryzias asinua</i>	Endangered	Indonesia	29
<i>Malpulutta kretseri</i>	Endangered	Sri Lanka	30

# Habitats of key interest

Some very specific habitats are unfortunately, but unsurprisingly, represented by a high number of species (651 combined) on the SHOAL Priority Fishes list. Four habitats have been identified as hosting an important proportion (28%) of species on the SHOAL Priority Fishes list. A focus on these habitats would drive the conservation of many Priority Fishes, particularly those with restricted ranges.



**Lake Endemics**  
319 Priority Fishes

Three hundred and nineteen SHOAL Priority Fishes are restricted and endemic to single lakes or lake complexes. Some lakes, such as Lake Victoria and Lake Malawi, have very high numbers of endemics. Conservation of lake species is often complicated, particularly when invasive species have been introduced, but conservation efforts that are concentrated and appropriately targeted can result in positive outcomes.



**Springs and Oases**  
176 Priority Fishes

One hundred and seventy-six SHOAL Priority Fishes are found in springs and oases. Springs are highly fragile habitats and are particularly threatened by climate change. Springs in very arid areas in particular provide a water source that is not only vital for fish, but also essential for the people living nearby. Many successful conservation outcomes have been achieved by protecting and restoring threatened fishes in springs because local communities are highly incentivized to protect both the fish and their water source.



**Subterranean Habitats**  
88 Priority Fishes

Eighty-eight species of SHOAL Priority Fishes are specialists to subterranean habitats such as caves and aquifers. These species are often quite extraordinary and fascinating. While the species are to some extent naturally protected by their isolation, these habitats are easily destroyed by pollution, mining, and unsustainable water extraction.



**Peat Swamps**  
68 Priority Fishes

Sixty-eight SHOAL Priority Fishes are restricted to peat swamps. Peat swamps, particularly those in lowland tropical areas, are one of the most threatened habitat types on the planet, but with direct action they are often straightforward to protect. A relatively small investment in conservation can make a big difference for these species.

# Migratory Fishes

One hundred and thirty SHOAL Priority Fishes (5.6%, Annex D) are listed by the World Fish Migration Foundation as being migratory. Migratory fishes often have complex life cycles, and require integrated and coordinated conservation efforts over long distances. They are often transboundary species, traveling through multiple countries. They are also often highly threatened by river barriers, such as dams, and therefore require significant conservation investment to secure their future. Because they often need conservation solutions that consider the context of the majority of the extent of a river, they can act as flagship or umbrella species that inspire conservation of entire rivers. The benefits of the types of conservation solutions they require can also support many additional co-occurring species and the health of the river itself.

Some river systems support more than one migratory SHOAL Priority Fish and efforts focused on those rivers can present greater cost-effectiveness of the Initiative. Just the nine rivers with a minimum of three migratory Priority Fishes each listed below are vital for a total of 45 SHOAL Priority Fishes:

River	Countries	Priority Fishes Count
Danube	Germany, Austria, Slovakia, Hungary, Croatia, Serbia, Romania, Bulgaria, Moldova, Ukraine	7
Mekong	China, Myanmar, Thailand, Lao PDR, Cambodia, Viet Nam	7
Ural	Russian Federation, Kazakhstan	7
Volga	Russian Federation	7
Cauvery	India	4
Colorado	United States, Mexico	4
Chao Phraya	Thailand	3
Mae Klong	Thailand	3
Terek	Georgia, Russian Federation	3

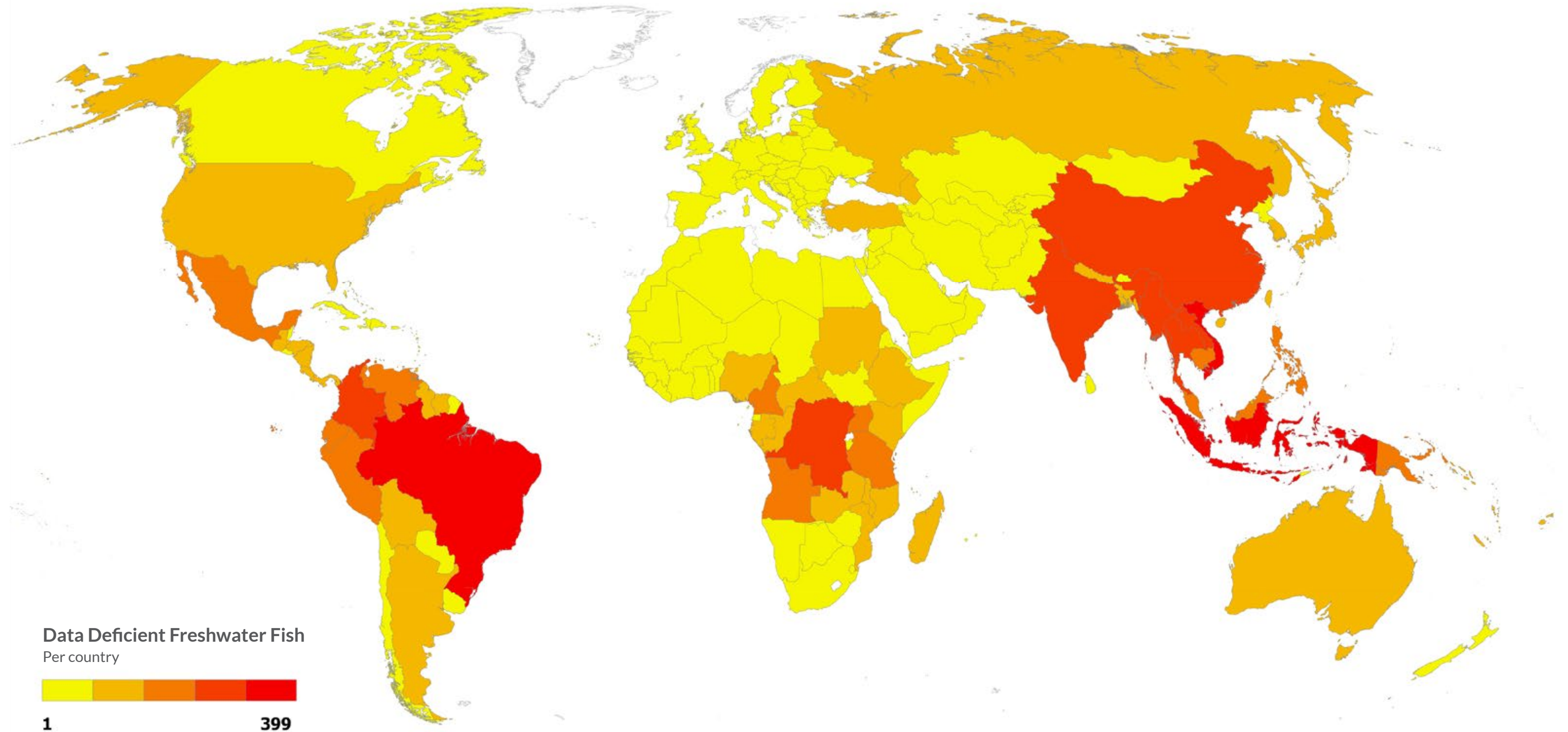
The Swimways program <https://globalswimways.com/> is dedicated to the conservation management of the aquatic systems important for migratory fishes and is presently developing more detailed information on the priority swimways that require attention. As that information becomes more detailed, it will be possible to develop a better understanding of which swimways are important for the migratory Priority Fishes. This will help the SHOAL partners direct their work to particularly valuable swimways.

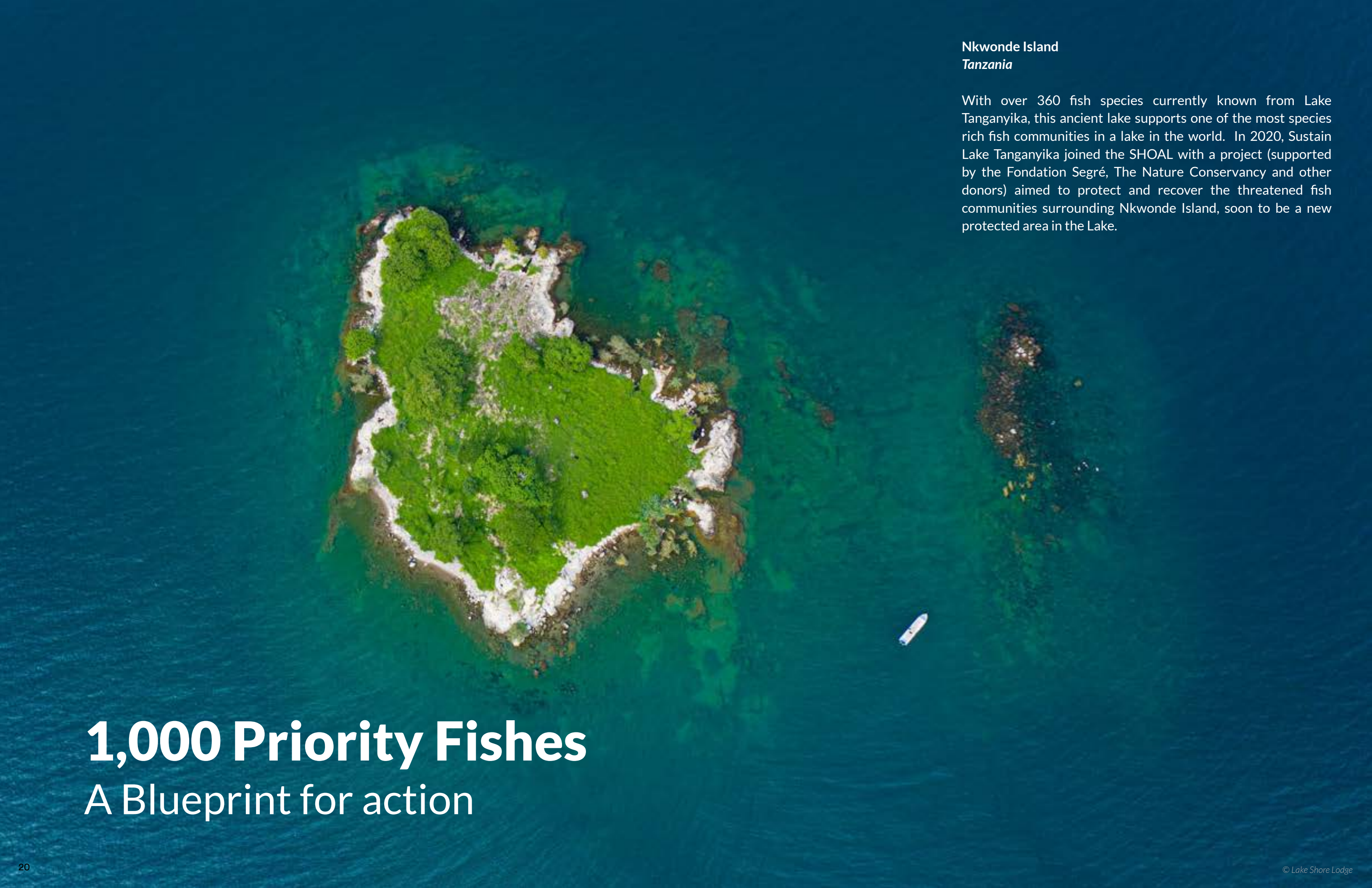


## Data deficient and unevaluated species

There are 2,643 Data Deficient species on the IUCN Red List, and 3,790 species have not yet been evaluated as of February 2024. A table showing the “Top 30” countries with the highest numbers of Data Deficient species can be found in Annex H.

Two limitations to the species-based approach for the conservation of freshwater fishes is the large number of species assessed as Data Deficient on the IUCN Red List and the many species that are Not Evaluated yet. Without these data, the true conservation status of these fishes is unknown. The task of ending extinctions of freshwater fishes may well be larger than currently understood, and further research and assessments are needed for these species. Some countries have much higher numbers of Data Deficient species than do others, and so should be prioritized for future research.





Nkwonde Island  
Tanzania

With over 360 fish species currently known from Lake Tanganyika, this ancient lake supports one of the most species rich fish communities in a lake in the world. In 2020, Sustain Lake Tanganyika joined the SHOAL with a project (supported by the Fondation Segré, The Nature Conservancy and other donors) aimed to protect and recover the threatened fish communities surrounding Nkwonde Island, soon to be a new protected area in the Lake.

# 1,000 Priority Fishes

## A Blueprint for action

# Action for 1,000 Freshwater Fishes

## The SHOAL

The SHOAL Initiative is founded on the idea that collective action leads to greater conservation impact. There simply is not enough time or opportunity to work via a single dedicated entity to achieve the goal. We must act and work together with a multitude of interests, like a shoal of fish, and the larger the SHOAL the more impactful we will be.

The SHOAL has three primary components:

The purpose of the SHOAL is to mobilize action as swiftly, extensively, and effectively as possible.

The purpose of the Blueprint is to provide direction for investment, participation and support to work toward the goal of action for 1,000 species by 2035.

The previous sections provided a thorough analysis of the 2,338 Priority Fishes, based on the present data available on the IUCN Red List and provided an overview of the patterns and priorities.

These have then been used to identify the best strategies for efficient and effective operations provided in the following Blueprint.



### Strategic Partners

SHOAL is consistently building an expanding network of Strategic Partners through communications, networking, outreach, working closely with the IUCN SSC Freshwater Fish Specialist Group, and engagement with a variety of sectors with almost any type of connection to freshwater fish or conservation. We demonstrate the potential for significant impact on biodiversity conservation via engagement in and support of freshwater fish conservation, and enable Strategic Partners to see the great potential of what they have to offer. Strategic Partners are those that significantly expand the strategic capacity of the SHOAL Core Team via dedicated engagement in technical or financial support to Local Action Partners, communications and outreach, transfer of scientific knowledge, provision of general funding, and monitoring by providing expertise and/or leveraging support at the global, national or local scales. They may include hundreds of organizations from any sector that want to help, such as universities, NGOs, companies, zoos and aquaria, hobby associations, donors, and governments.



### Local Action Partners

SHOAL is focused on ensuring that direct action for a species, groups of species, or habitat is led and sustained by local stakeholders. These partners can be local communities, Indigenous peoples, organizations, universities, governments or individuals that have taken on the responsibility to support conservation and recovery of one or more priority freshwater fish species. The Local Action Partners are supported by the core team of the SHOAL and by the Strategic Partners. The SHOAL Core Team works very closely with Local Action Partners to ensure they have the capacity, information, and resources needed to achieve success in their conservation efforts. This includes provision of technical knowledge and skills, support in design of conservation actions, assistance with fundraising, guidance on program management and troubleshooting. Often Strategic Partners support Local Action Partners via provision of funds, transfer of technical knowledge, communications, and enhancing support at local, national, and international levels.



### SHOAL Core Team, governance & advisory structure

At the center, developing conservation strategies, building local capacity, mobilizing conservation actors, and identifying funding opportunities, the SHOAL is the lean Core Team (with the governance and advisory structure). The Core Team is a dedicated team that leads the Initiative and manages funds and grant programs, develops conservation strategies and plans for regions or groups of species, helps to identify appropriate Local Action Partners, supports them in fundraising efforts, links Strategic Partners to meet the needs of Local Action Partners, builds strategic alliances such as the SHOAL Zoo and Aquaria Alliance for Freshwater Species Conservation, provides a powerful communication platform for the work of all of the partners and monitors the progress of the Initiative and the impact of the SHOAL. The Core Team is consistently working to expand the capacity of the Initiative by engaging Strategic Partners who can in turn also provide support to the Local Action Partners.

# The Seven Blueprint Strategies

## 1. Building and strengthening the SHOAL

SHOAL is building a strong network of partners across the world with sufficient capacity to make a real difference. There are many organizations and institutions that already are supporting action for the Priority Fishes but there remains a significant gap in the scope and scale of effort required. Where there is no local capacity, which is more common than not, SHOAL will seek to create and sustain it through funding, grant programs, development grants and training and technical support for such things as monitoring, evaluations and communications. A key role of the Core Team is to help bring together Local Action Partners and Strategic Partners to form strengthened local networks. For example, if a community organization requires scientific expertise they can be partnered with another Local Action Partner or a Strategic Partner that can fill that need. In return the community organization may share their skills. Strategic Partners, often mobilized by the Core Team, can play a key role in supporting new Local Action Partners.

Further work is required to assess the capacity levels in each of the Priority Countries. Results will help guide the activities of Strategic Partners to support capacity building where it is most needed to empower Local Action Partners. In addition to building institutional capacity, efforts will be focused on supporting a new generation of fish and freshwater conservationists by supporting young conservationists through training and linking them with relevant experts across the globe.

## 2. Identifying existing and potential opportunities for Priority Fishes protection

One of the first opportunities to account for levels of conservation action for many species is to identify whether they already receive any level of protection, regardless of what the IUCN Red List assessments indicate. Some assessments are quite old and the situations for many species may have changed since they were published. Additionally, just because a freshwater fish is distributed within a Protected Area (PA) it doesn't necessarily receive any protection. The majority of PAs are focused on terrestrial habitats and species, and if they happen to include some freshwater fish their management

plans rarely factor in such species. It is rare for them to be designed or managed for conservation of freshwater habitats or species. However, depending on the goals of the PA managers and government authorities, there may be cases where it is likely possible to mobilize action relatively simply by working with the government to modify PA management strategies to include threatened freshwater fishes present in the PA. The SHOAL Core Team, together with Strategic Partners, will initiate a global analysis of the present and potential protection through PAs and other protection measures and identify the "low hanging fruit" opportunities on which we will act rapidly.

## 3. Coupling with existing essential initiatives

There are a number of key initiatives that are already in place that could make a significant contribution to the 1,000 fishes goal and tackle key themes that have consistently been identified in the analysis as priorities. These include:

### IUCN SSC Freshwater Fish Specialist Group

[freshwaterfish.org](http://freshwaterfish.org)

- Share technical expertise with Local Action Partners
- Expand potential pool of Local Action Partners
- Identify current levels (if any) of protection for Priority Fishes
- Undertake research to inform assessments of Data Deficient species
- Undertake assessments of species not yet evaluated

### World Fish Migration Foundation

[worldfishmigrationfoundation.com](http://worldfishmigrationfoundation.com)

- Promote barrier removal impacting migratory species
- Identify the most important swimways so they will be protected
- Raise awareness and promote engagement among local actors

### EDGE of Existence

[edgeofexistence.org](http://edgeofexistence.org)

- Identify the priority species that are especially evolutionary distinct as well as highly endangered
- Education, outreach, communications, and awareness raising
- Include SHOAL in their next update so everyone's data needs are aligned





#### **Freshwater Challenge**

[freshwaterchallenge.org](https://freshwaterchallenge.org)

- Aims to restore 300,000 km of degraded rivers and 350 million hectares of degraded wetlands by 2030, which will support recovery of some Priority Fishes (with the number of benefitting species dependent upon locations where restoration is implemented)
- A country-led initiative, 46 participating so far, which provides a solid pathway for engaging governments in actions to advance freshwater fish conservation beyond habitat restoration alone

#### **Freshwater Life**

[fwlife.org](https://fwlife.org)

- Provide project planning input and engage in invasive species control or eradication efforts necessary to conserve Priority Fishes
- Invasive species have been a primary cause of freshwater extinctions, so engagement with this partner will apply to the conservation of many species

#### **Alliance for Freshwater Life**

[allianceforfreshwaterlife.org](https://allianceforfreshwaterlife.org)

- They promote awareness and protection of freshwater biodiversity through research, data synthesis, conservation, education, outreach, and policy-making
- They can conduct research and data synthesis to support conservation activities by Local Action Partners, collect necessary data for DD species to determine their actual level of threat, and assess species not yet evaluated for the IUCN Red List. This would help to ensure the Priority Fishes list is more comprehensive.
- They can engage in policy-making that could create the enabling conditions to more rapidly and thoroughly conserve and recover many of SHOAL's Priority Fishes

#### **IUCN SSC Asian Species Action Partnership**

[speciesonthebrink.org](https://speciesonthebrink.org)

- They can mobilize action, and sometimes funding, for the most threatened (Critically Endangered) SHOAL Priority Fishes in Asia
- They have an extensive network of member organizations active in conservation that can be leveraged to expand SHOAL's partnership network so that more projects for Priority Fishes can be implemented

#### **4. Leading ex situ conservation action**

At least 13% of the SHOAL Priority Fishes have been identified as requiring ex situ action, and 52% of them are Critically Endangered. In 2024, SHOAL launched the SHOAL Alliance of Zoos and Aquaria for Freshwater Species Conservation. One purpose of this Alliance is to provide a powerful platform for supporting efforts to initiate and maintain ex situ populations of threatened freshwater fishes that will ultimately support in situ recovery programs.

#### **5. Engaging hobbyist, angling and fisheries interests**

There is already a large constituency of support for freshwater fishes, that can be found in the hobbyist, angling, and (to a degree) fisheries sectors. Millions of people either keep fish as pets or visit freshwater habitats to undertake one of the world's most popular hobbies, angling. Fishes are unique compared to most wild animals, as the harvesting of their wild populations occurs on a massive scale to provide food for millions of people and is a fully accepted part of their management. Many of the Priority Fishes are harvested for food, so programs to restore these fisheries and establish sustainable management practices will have benefits for the recovery of these threatened species as well as for local economies and food security. The sectors described above represent a substantial, yet insufficiently tapped, source of support and action expansion for freshwater fish conservation.

#### **6. Dealing with Data Deficient and unevaluated species**

The limitation of the Blueprint is the substantial number of freshwater fishes that are either categorized as Data Deficient or that have not yet been evaluated. It can be assumed that if we knew more about these fishes or they underwent assessment for the IUCN Red List, a significant number of species would be added to the SHOAL Priority Fishes list. Support to researchers and conservationists to gather the necessary information needed to adequately assess the conservation status and needs of these species, and support to undertake assessments of more species, will be important to saving the full diversity of threatened freshwater fishes.

# 7. SHOAL Investment priorities

## There are 2,338 SHOAL Priority Fishes. Each species is a target for conservation action.

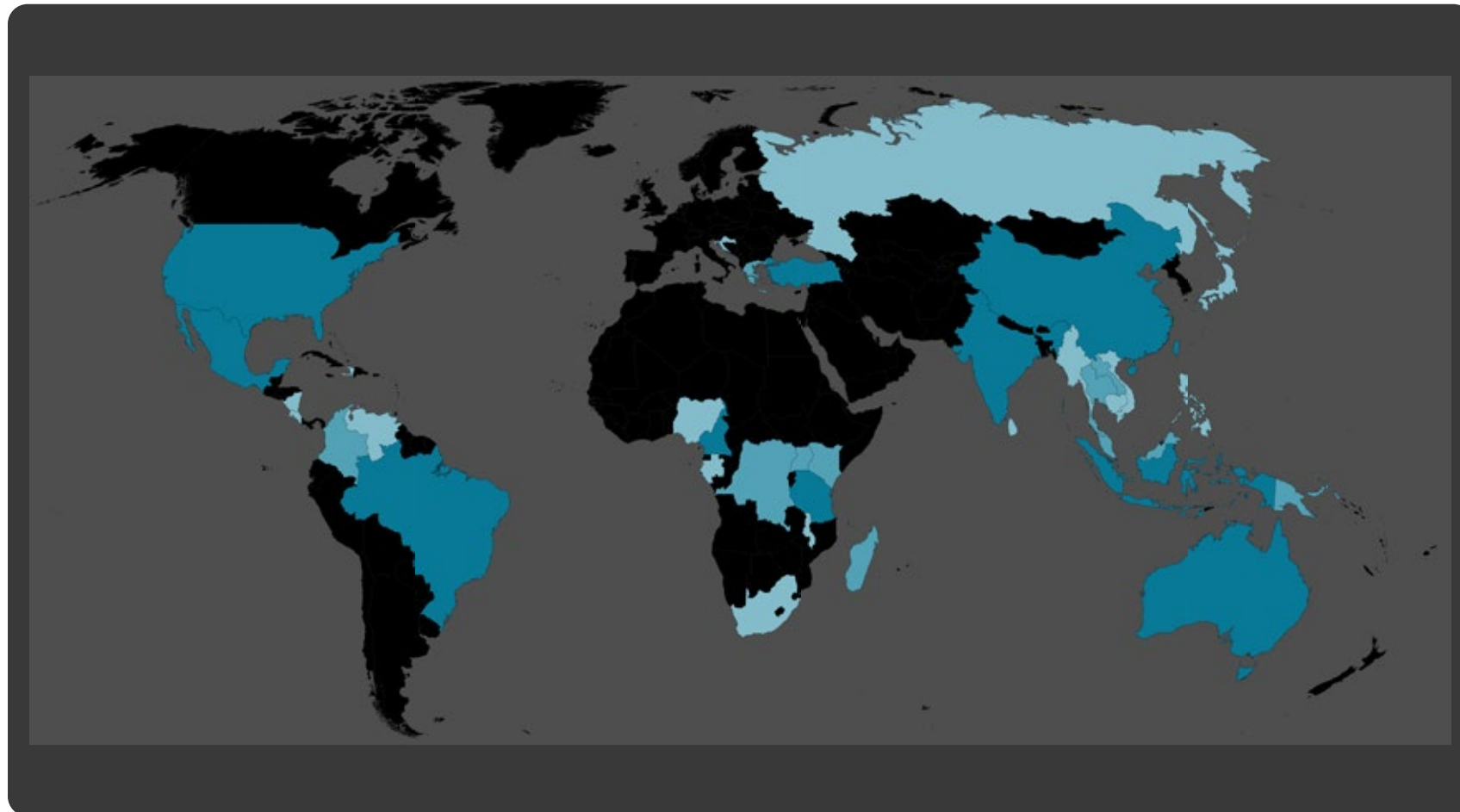
To maximize the efficiency of the Initiative, the central strategy of the Blueprint will focus efforts on those genera, habitats and places which will give the most impact for a certain level of investment. Action centered on these priorities will allow the SHOAL Initiative to move as efficiently as possible towards the goal of catalyzing action for 1,000 species. The aim is not to exclude other areas and species as all are in need of action, but where possible, to concentrate efforts on the priorities with a high return on investment.

## 89% of the Priority Fishes are found in relatively small areas.

One of the main conclusions from the analysis is that most of the SHOAL Priority Fishes are distributed in relatively small areas (2,075 species or 89% of all SHOAL Priority Fishes) and therefore efforts to conserve them can be more manageable. For this reason we will focus investment at the local level supporting Local Action Partners.

## Priority Countries

The majority of the Priority Fishes occur, formerly occurred, or possibly occur in only 10 countries. Thirty-six countries have been identified as Priority Countries, with a further 22 countries categorized as being of “Special Interest”. Effective conservation in these 36 countries alone would result in major progress towards the goal of catalyzing action for 1,000 of the Priority Fishes. The SHOAL Initiative will build coalitions of Local Action Partners across these Priority Countries and work to ensure sufficient capacity exists to deliver effective conservation.



Country <i>alphabetical order</i>	High number of Priority Species <i>&gt;2% of total</i>	Presence of Priority Genera	Presence of Priority Area	Presence of Priority Rivers	Presence of Priority Lakes
Australia	Yes	Yes	No	No	Yes
Brazil	Yes	Yes	Yes	No	No
Cambodia	No	No	Yes	Yes	No
Cameroon	Yes	Yes	Yes	No	Yes
China	Yes	Yes	Yes	No	Yes
Colombia	Yes	No	No	No	No
Costa Rica	No	Yes	Yes	No	No
Croatia	No	No	Yes	No	No
Congo, DRC	Yes	Yes	Yes	No	Yes
Gabon	No	No	Yes	No	No
Greece	Yes	Yes	Yes	No	No
Haiti	No	Yes	Yes	No	Yes
India	Yes	Yes	Yes	Yes	No
Indonesia	Yes	Yes	Yes	No	Yes
Japan	No	Yes	Yes	No	Yes
Kenya	Yes	Yes	Yes	No	Yes
Lao PDR	Yes	Yes	Yes	Yes	No
Madagascar	Yes	No	Yes	No	No
Malawi	No	Yes	Yes	No	Yes
Malaysia	Yes	Yes	Yes	No	No
Mexico	Yes	Yes	Yes	No	Yes
Myanmar	No	Yes	Yes	Yes	Yes
Nicaragua	No	Yes	Yes	No	Yes
Nigeria	No	Yes	Yes	No	No
Papua New Guinea	Yes	Yes	Yes	No	Yes
Philippines	Yes	Yes	No	No	No
Russia	No	Yes	No	Yes	No
South Africa	No	Yes	No	No	No
Sri Lanka	No	Yes	Yes	No	No
Tanzania	Yes	Yes	Yes	No	Yes
Thailand	Yes	Yes	Yes	Yes	No
Turkey	Yes	Yes	Yes	No	No
Uganda	Yes	Yes	Yes	No	Yes
United States	Yes	Yes	Yes	Yes	No
Venezuela	Yes	Yes	No	No	No
Viet Nam	No	Yes	Yes	Yes	No

*\*Note that efforts in China and India will not be spread across the entire country but will primarily focus on Yunnan Province in China and the Western Ghats of India. For countries with existing considerable capacity and resources, efforts will be focused on mobilizing those resources rather than providing additional support.*

# 7. SHOAL Investment priorities

## Priority lakes

Lakes and lake complexes have been identified as supporting high numbers of threatened species, while also being well-suited for conservation attention. Some of these lakes are already identified as Priority Areas because of the high number of Priority Fishes they host, and some additions are made due to the high number of endemic fish confined to these lakes.

### East African Rift Valley Lakes

Malawi, Victoria, Tanganyika, Nabugabo, George, Kachira, Rukwa, Kijanebalola, Kyoga, Kyungululu, Malombe  
 “Lake Victoria”, “Lake Malawi” and “Lake Tanganyika” are also three separate Priority Areas.

### Papua/West Papua/Papua New Guinea Lakes

Kutubu, Sentani, Aiwaso, Furnusu, Lakamora, Tebera, Kaifayama, Kurumoi, Nenggwambu, Tage, Triton Lakes, Wanam  
 Some of these are included in the Priority Area “Lake Kutubu and surrounding area”

### South East Asia Lakes

Inle Lake, Sulawesi Lakes (Malili Lakes, plus Poso, Lindu, Tondona, Tiu)  
 Inle Lake is also part of the Priority Area “Inle Lake - Salween Drainage”

### Tasmanian Lakes, Australia

Great, Penstock Lagoon, Shannon Lagoon, Woods, Crescent, Oberon

### Yunnan Lakes, China

Dianchi, Fuxian, Er Hai, Qilu, Xingyun, Cheng Hai, Yangzong, Qiyong

### Nicaraguan Lakes

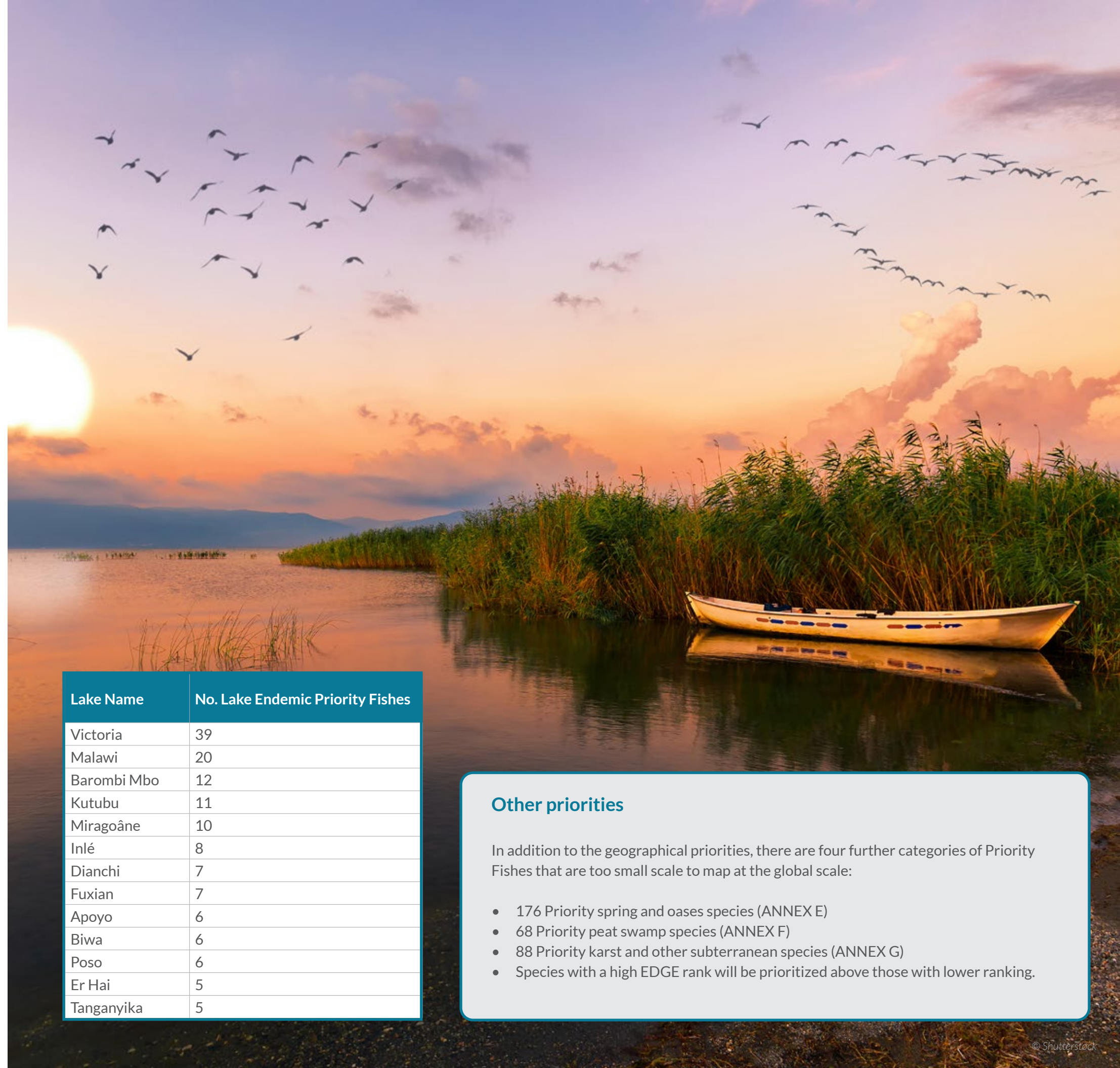
Apoyo, Xilola, Asosoca, Jiloá  
 These lakes are also part of the Priority Area “Nicaraguan Crater Lakes”

### Individual lakes

Barombi Mbo, Cameroon  
 Miragoâne, Haiti  
 Biwa, Japan - This lake is part of the Priority Area “Lake Biwa and surrounding area”  
 Mai-N'dombe, Democratic Republic of Congo

### Other Priority Areas with Priority Lakes

Lake Chichancanab, Mexico  
 Lerma-Chapala, Mexico



Lake Name	No. Lake Endemic Priority Fishes
Victoria	39
Malawi	20
Barombi Mbo	12
Kutubu	11
Miragoâne	10
Inlé	8
Dianchi	7
Fuxian	7
Apoyo	6
Biwa	6
Poso	6
Er Hai	5
Tanganyika	5

### Other priorities

In addition to the geographical priorities, there are four further categories of Priority Fishes that are too small scale to map at the global scale:

- 176 Priority spring and oases species (ANNEX E)
- 68 Priority peat swamp species (ANNEX F)
- 88 Priority karst and other subterranean species (ANNEX G)
- Species with a high EDGE rank will be prioritized above those with lower ranking.

# What does saving 1,000 species look like?

## The IUCN SSC Freshwater Fish Specialist Group and the IUCN Freshwater Biodiversity Unit

These two bodies of IUCN have laid the critical foundations for the SHOAL Initiative and are responsible for delivering the Red List assessments on which the Blueprint has been developed. They are both responsible for leading the Assess - Plan - Act objectives of the IUCN SSC Species Strategy, which this Blueprint principally aims to deliver on. It will be essential to support both of these bodies as part of the investment plan for the SHOAL Initiative to keep the Red List assessments up to date and drive implementation of the wider strategy.

## Contribution of the SHOAL 1,000 Fishes Initiative to global priorities

In addition, there are many global and international strategies, agreements and action plans that this Blueprint will make a very significant contribution to such as:

### 1. Kunming Montreal Global Biodiversity framework, specifically:

Target 2: Restore 30% of all Degraded Ecosystems

Target 3: Conserve 30% of Land, Waters and Seas

Target 4: Halt Species Extinction, Protect Genetic Diversity, and Manage Human-Wildlife Conflicts

Target 9: Manage Wild Species Sustainably To Benefit People

Target 10: Enhance Biodiversity and Sustainability in Agriculture, Aquaculture, Fisheries, and Forestry

### 2. Agenda 2030/Sustainable Development Goals

SDG 15 – Life on land

SDG 6 – Clean water and sanitation

SDG 17 – Partnerships for the goals (I included this as SHOAL is working to encourage and promote “effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships”)

### 3. Nature 2030 – IUCN Program 2021-2024

4.3 Water The loss of freshwater species and decline of freshwater ecosystem health is halted, and restoration initiated

### 4. UNFCCC Global Goal on Adaptation Framework, more specifically:

1(d) Reducing climate impacts on ecosystems and biodiversity, and accelerating the use of ecosystem-based adaptation and nature-based solutions, including through their management, enhancement, restoration and conservation and the protection of terrestrial, inland water, mountain, marine and coastal ecosystem”

### 5. Strategic Plan for Migratory Species (2015-2023)

Convention on the Conservation of Migratory Species of Wild Animals and whatever succeeds it.

Goal 2: Reduce the direct pressures on migratory species and their habitats.

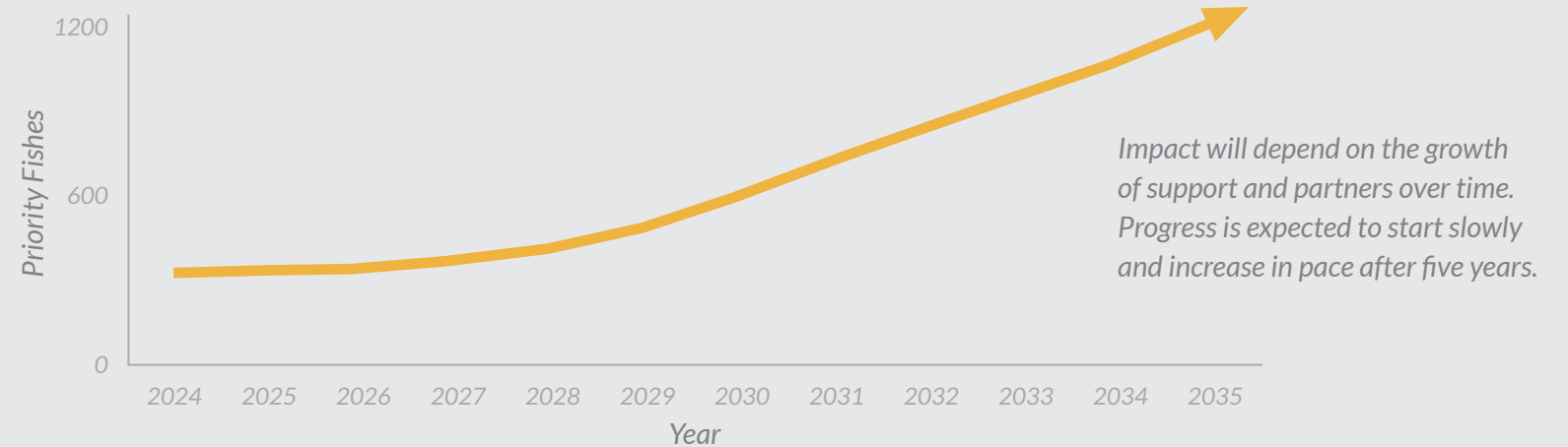
## Financial Investment

The investment required to achieve the goal is in the region of USD 105 million over ten years corresponding to a rough average of USD 100,000 per species. This total funding is the cumulative incremental investment required by all of the partners to achieve the 1,000 Fishes goal.

There will be many benefits of this investment that exceed action simply for individual fish species such as:

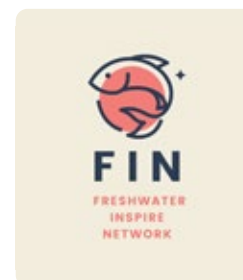
- millions of hectares/kilometers of freshwater habitat protected or restored,
- thousands of other threatened freshwater species under conservation action,
- potentially significant recovery of local and commercial fisheries,
- support for hobby based economies, and
- improved IUCN Red List data.

Furthermore, it will demonstrate that coordinated, strategic, direct action for neglected and overlooked species can be achieved at scale given the appropriate levels of attention and investment.



## Monitoring and Reporting

Key to the success of the Initiative will be careful and regular monitoring of progress. The SHOAL core team together with the IUCN SSC FFSG will ensure that progress for each species is individually monitored by engaging with the network and SHOAL partners across the globe.



### INSPIRE

*Raising awareness and engagement in freshwater species conservation*

Underpinning the SHOAL Initiative is the need to increase awareness of and engagement in the importance, beauty and status of freshwater biodiversity, particularly freshwater fishes. In 2022, SHOAL formed the Freshwater Inspire Network (FIN) with the goal to bring together communications and engagement experts to escalate attention for freshwater species.

## Acknowledgments

The Blueprint is dedicated to all the freshwater fish scientists and contributors to the IUCN Red List and to all present and future SHOAL partners that will help end the freshwater biodiversity crisis.

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