
THE SHOAL ALLIANCE
OF ZOOS AND AQUARIA
for freshwater species conservation
ZOOS AND AQUARIA ARE ALREADY
SAVING FRESHWATER SPECIES.
TOGETHER, WE CAN SCALE IT.

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THE POWER OF ZOOS AND AQUARIA

AN UNTAPPED CONSERVATION WORKFORCE ALREADY IN PLACE

Public zoos and aquaria are leaders in the conservation of threatened species. Many already have robust ex situ programmes that provide vital lifelines for some of the world's most threatened freshwater fishes.

They have:

- exemplary captive breeding experience and facilities,
- biosecurity expertise,
- genetic and demographic planning capacity,
- a wealth of expertise and partnerships with in situ individuals and organisations.

They are uniquely organised for improving and increasing education of the incredible nature of freshwater ecosystems, and for inspiring generations to cherish and take action for freshwater biodiversity.

Investing in existing zoo and aquaria capacity is one of the most efficient and cost-effective ways to respond to the accelerating freshwater biodiversity crisis.

COORDINATED CONSERVATION ON AN UNMATCHED SCALE

Modern zoos and aquaria function as evidence-based conservation institutions. Through global coordination mechanisms such as the Zoological Information Management System (ZIMS), zoological institutions share demographic, genetic and health data at an unmatched scale, enabling evidence-based population management and collaborative conservation planning across institutions and regions (Conde et al., 2011, Species360, 2023). When fully utilised, this network allows zoos and aquaria to operate as global metapopulations, ensuring sufficient genetic diversity, and supporting species that would otherwise be impossible to manage effectively within isolated facilities or research projects dependent on short term funding cycles.

THE ALLIANCE'S POTENTIAL

Zoos and Aquaria have a strong history of taking action for freshwater species conservation. With a shared ambitious set of objectives and by working effectively together, they have the potential to build on their powerful foundations to become transformational, supporting the people that rely on this valuable biodiversity and help end further loss of essential species and habitats.

ZOOS AND AQUARIA ARE ALREADY COLLABORATING TO GREAT EFFECT

Some of the greatest examples of freshwater fish conservation come from zoos and aquaria working together: just look at what has been achieved for the Golden Skiffia and Tequila Splitfin in Mexico with the collaboration between Chester Zoo, Guadalajara Zoo, ZooParc de Beauval, and Haus des Meeres, or what Zoological Society of London, Bristol Zoological Society, San Antonio Zoo, Vienna Zoo, Guadalajara Zoo, Acuario Inbursa, and Gran Acuario Mazatlán have achieved together for Mexican Pupfish.

Collaboration works: it increases visibility and funding leverage, it streamlines the sharing of information, knowledge and resources, and it generates shared momentum along the same tracks, instead of institutions moving in similar, but ultimately different, directions. Collaboration heightens effectiveness: we just need more of it.

SHOAL's role is to convene partners and ensure the collaboration leads to greater conservation impact.

The Alliance will:

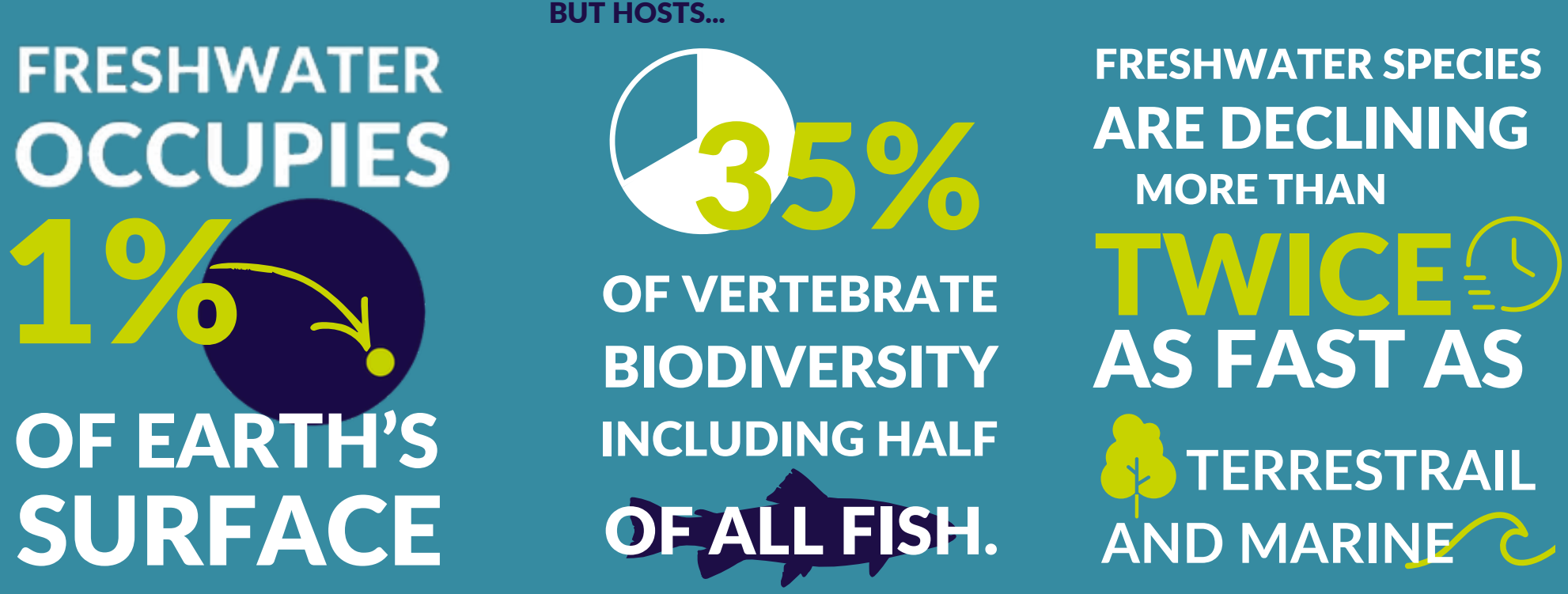
- raise awareness of the beauty, richness and fragility of freshwater species and habitats and inspire engagement, support, and action,
- establish and collaborate on conservation breeding programmes for freshwater species,
- provide technical support and build capacity of field partners acting to halt extinctions,
- contribute funding and fundraising support to the alliance's priorities.

We need YOUR zoo or aquarium to be involved!

A CALL TO ACTION

EARTH'S FASTEST-ACCELERATING BIODIVERSITY CRISIS

While occupying only 1% of the Earth's surface, freshwater ecosystems support around 10% of all described species, including 51% of fish species (Reid et al., 2019; Darwall et al., 2018; Eschmeyer and Van der Laan., 2025). Despite the disproportionate importance of this biodiversity, it has been failed by conservation efforts for decades, leading to freshwater biodiversity declines two to three times faster than terrestrial or marine biodiversity.



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ACTING BEFORE COLLAPSE, NOT AFTER

Zoos and aquaria already maintain thousands of freshwater species, including over 3,100 fish species (~14% of all fish species, and the majority of Extinct in the Wild species) and more than 1,100 amphibian species. Freshwater invertebrates, plants, and traditionally 'less charismatic' taxa are largely underrepresented or untracked, revealing gaps and opportunities for coordinated conservation efforts within these groups (da Silva et al., 2019; Stuart et al., 2004; Scheele et al., 2019).

Whilst the representation of freshwater species within zoos and aquaria is not yet proportionate to extinction vulnerability, and ex situ programmes have often been initiated only once populations have collapsed in the wild (Scheele et al., 2019), there is growing demand from the zoo and aquarium community to act early and to establish populations before collapse occurs, and take a more proactive role in reintroductions.

CONTAINING DISEASE BEFORE IT CAUSES EXTINCTION

An often-overlooked role of zoos and aquaria is in preventing the spread of disease and building resilience in freshwater species. They establish biosecure assurance populations for species at risk of disease-driven extinction, such as through the Amphibian Ark, and advance diagnostics and treatment protocols, for example, detecting and preventing the first UK case of *Bsal* at ZSL, and monitoring spread in wild populations via initiatives like the Garden Wildlife Health Project. These efforts show how zoological institutions can rapidly detect, contain, and respond to emerging disease threats.


© Shedd Aquarium

STORYTELLING SAVES SPECIES

Zoos and aquaria offer unparalleled opportunities to make freshwater biodiversity loss visible, urgent, and emotionally compelling to mass audiences. By linking exhibits with conservation science, recovery programmes, and field partnerships, zoos and aquaria communicate the urgency of freshwater biodiversity loss and mobilise public and political support in ways rarely achievable through academic channels alone.

A species-saving example came from Dr. Brian Zimmerman at ZSL in 2013, where he and the zoo's press team created a campaign centred on a playful but urgent "wanted" poster for a missing female Mangarahara Cichlid. That single outreach tool transformed a quiet extinction into an international search, triggering global media coverage and public responses that ultimately led to the rediscovery of the species in the wild and its survival.

WORKING ON THE GROUND, NOT JUST EX SITU

Zoos and aquaria do not operate in isolation from the wild: they can actively drive recovery-focused conservation on the ground in partnership with local organisations, such as with the reintroduction of the Tequila Splitfin, once declared Extinct in the Wild. Institutions including Chester Zoo and Zoological Society of London worked in close partnership with local partners and aquarium hobbyists including Universidad Michoacana de San Nicolás de Hidalgo (through its FishArk programme), CONABIO, the Teuchitlán Municipality, and El Rincón Spa to breed the species in captivity, restore spring habitats near Tequila, and return fish to the wild. This collaboration illustrates how zoo-led ex situ programmes, when embedded in strong local partnerships and habitat recovery, can move a species from extinction in the wild to sustainable recovery.

A CRISIS WE CAN STILL TURN AROUND

Freshwater biodiversity loss is one of the fastest-moving and least-addressed conservation crises on the planet, but it is not inevitable. Zoos and aquaria already possess the expertise, infrastructure, and global reach needed to change this trajectory. What is missing is sufficient investment and strategic prioritisation commensurate with extinction risk.

The SHOAL Alliance of Zoos and Aquaria is mobilising its members and partners to accelerate and escalate freshwater species conservation now. This network can move from isolated successes to sustained, global impact.

© Aquarium tropical, Paris

PARTNER FEATURES

Mussel Release, © Columbus Zoo

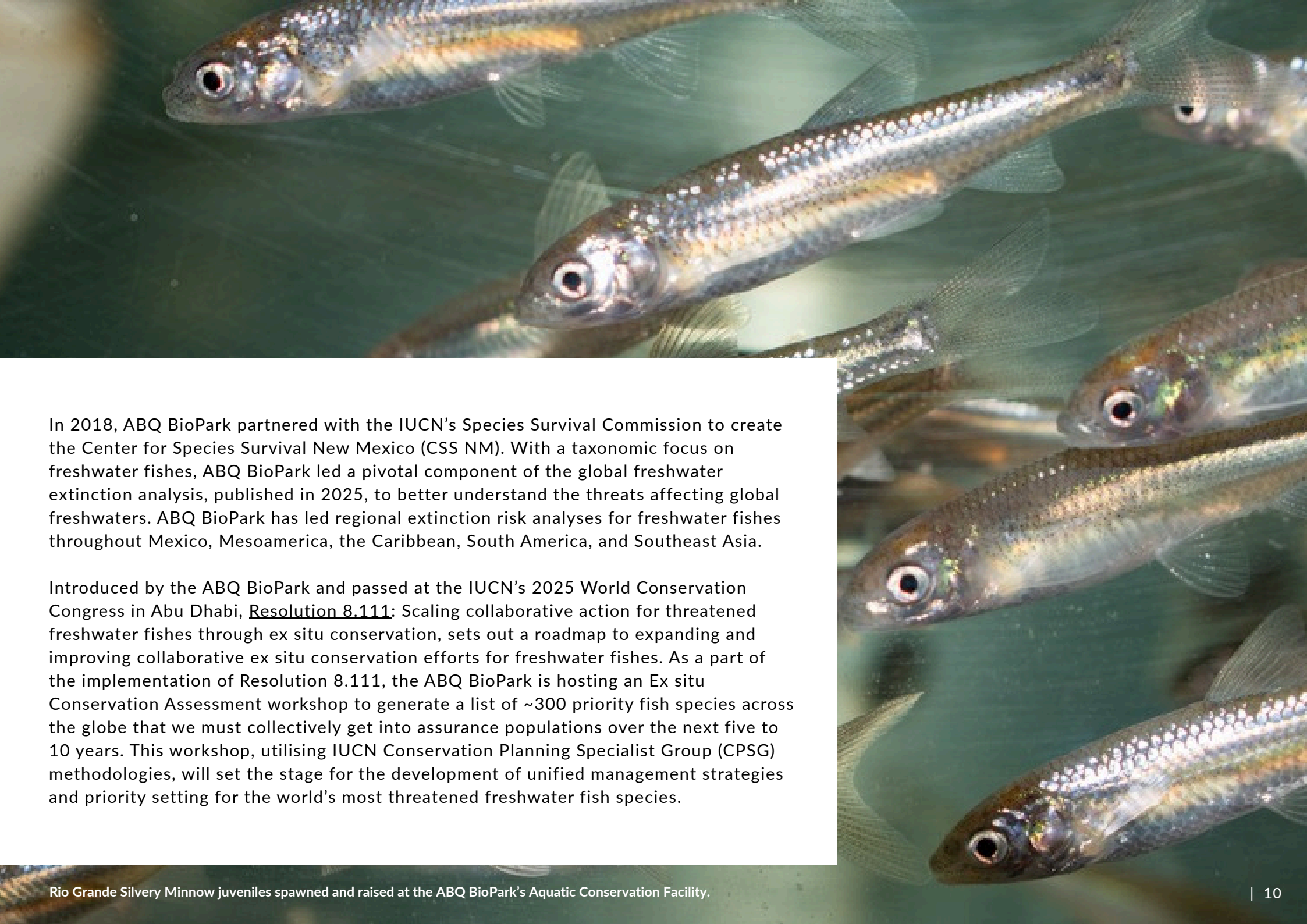
ABQ BIOPARK

ABQ BioPark staff acclimate Rio Grande Silvery Minnows to environmental water temperatures during a scheduled release in fall 2025.

CONSERVATION EFFORTS & OUTCOMES

Founded in 1927 as the Rio Grande Zoo on land designated as a natural corridor by the City of Albuquerque's first environmental planner and famed conservationist Aldo Leopold, the ABQ BioPark and New Mexico BioPark Society (hereafter ABQ BioPark) has deep roots in aquatic species conservation and environmental stewardship. Their facility supports long-term species-specific conservation projects, new innovative joint partnerships with the IUCN's Species Survival Commission, and works through dedicated conservation staff to conserve the waters of the Southwestern United States and globally.

Since 2000, ABQ BioPark has participated in various state level in situ and ex situ projects that target New Mexico's most imperilled freshwater species. One focal species is the Rio Grande Silvery Minnow (*Hybognathus amarus*), a small pelagic minnow now present in just 6% of its historical range. ABQ BioPark supports the federal recovery plan for this species by raising and releasing between 40,000-100,000 minnows each year, supported by their dedicated Aquatic Conservation Facility (ACF). The ACF also supports assurance populations of Zuni Bluehead Sucker (*Catastomus discobolus yarrowi*), Mexican Splitfins (family Goodeidae), Socorro Isopod (Thermosphaeroma thermophilum), and Bitter Lakes Springsnail (*Juturnia kosteri*).



In 2018, ABQ BioPark partnered with the IUCN's Species Survival Commission to create the Center for Species Survival New Mexico (CSS NM). With a taxonomic focus on freshwater fishes, ABQ BioPark led a pivotal component of the global freshwater extinction analysis, published in 2025, to better understand the threats affecting global freshwaters. ABQ BioPark has led regional extinction risk analyses for freshwater fishes throughout Mexico, Mesoamerica, the Caribbean, South America, and Southeast Asia.

Introduced by the ABQ BioPark and passed at the IUCN's 2025 World Conservation Congress in Abu Dhabi, Resolution 8.111: Scaling collaborative action for threatened freshwater fishes through ex situ conservation, sets out a roadmap to expanding and improving collaborative ex situ conservation efforts for freshwater fishes. As a part of the implementation of Resolution 8.111, the ABQ BioPark is hosting an Ex situ Conservation Assessment workshop to generate a list of ~300 priority fish species across the globe that we must collectively get into assurance populations over the next five to 10 years. This workshop, utilising IUCN Conservation Planning Specialist Group (CPSG) methodologies, will set the stage for the development of unified management strategies and priority setting for the world's most threatened freshwater fish species.

Rio Grande Silvery Minnow juveniles spawned and raised at the ABQ BioPark's Aquatic Conservation Facility.

LOCATION

In situ conservation: New Mexico, United States
Extinction risk assessment and ex situ conservation: North America, Central America, Mexico, Caribbean, South America, Sunda Basin
IUCN Resolution Implementation and CSS NM
Extinction Risk Analysis: Global

KEY COLLABORATORS

New Mexico Department of Wildlife
US Fish and Wildlife Service
City of Socorro
SHOAL
Re:wild
IUCN Species Survival Commission Chair's Office
IUCN Biodiversity Assessment and Knowledge Team
IUCN SSC Freshwater Fish Specialist Group
IUCN SSC Conservation Planning Specialist Group
IUCN SSC Mollusc Specialist Group

Top: Spotted Skiffia- Spotted Skiffia (*Skiffia multipunctata*) held at the ABQ BioPark's Aquatic Conservation Facility as an assurance population.

Bottom: Tequila Splitfin held at the ABQ BioPark's Aquatic Conservation Facility as an assurance population.

AQUARIUM TROPICAL

© Aquarium Tropical

AQUARIUM TROPICAL

CONSERVATION EFFORTS & OUTCOMES

Aquarium Tropical participates in three EAZA Ex Situ Programmes (EEPs) covering the families *Aplocheilidae*, *Cyprinodontidae* and *Poeciliidae*, and coordinates the *Bedotiidae* EEP. Through these programmes, the aquarium maintains and breeds nine threatened freshwater fish species:

- *Bedotia madagascariensis* - Endangered (EN)
- *Cyprinodon alvarezi* - Extinct in the Wild (EW)
- *Cyprinodon meeki* - Endangered (EN)
- Cyprinodon simus - Near Threatened (NT)
- *Pachypanchax arnoulti* - Vulnerable (VU)
- *Pachypanchax sakaramyi* - Endangered (EN)
- *Quintana atrizona* - Critically Endangered (CR)
- *Rheocles vatosoa* - Endangered (EN)
- Xiphophorus meyeri - Extinct in the Wild (EW)

These populations provide long-term genetic security and support future conservation actions, including recovery and reintroduction planning.

Aquarium Tropical coordinates the Fish Net Madagascar programme, a multidisciplinary initiative working in the Amboaboa River watershed, near Marotandrano in northern Madagascar. This basin is recognised as a Key Biodiversity Area and represents the last known stronghold for the Critically Endangered species *Ptychochromis insolitus*, *Paretroplus gymnopreopercularis* and *Rheocles derhami*. Additional endemic species present include *Paretroplus nourissati*, *Sauvagella robusta* and *Pachypanchax sp. "Sofia"*.

Since 2013, emergency ex situ populations of *P. insolitus* and *P. nourissati* have been established in Madagascar, alongside multiple international assurance populations. According to ZIMS, 1,139 individuals of *P. insolitus* are now maintained across 21 zoological institutions worldwide.

The programme is also assessing assisted migration as a medium-term conservation solution, following IUCN translocation guidelines. This includes disease risk analysis conducted by specialists from the Zoological Society of London (ZSL), long-term water quality monitoring at six river sites by Madagascar National Parks (MNP), and ecological surveys to identify suitable host habitats.

Community Collaboration and Outcomes Local communities play a central role. The environmental NGO Madagasikara Voakajy has led social research to integrate local knowledge, cultural practices, and dam management considerations into conservation planning. In parallel, community-managed pond systems support backup populations of endemic fishes, improve food security, and reduce pressure on wild stocks. This work is implemented with local association APPA and supported by a National Geographic grant.

LOCATION

France (ex situ) and Madagascar, Amboaboa River watershed, Marotandrano region.

KEY COLLABORATION

EAZA Freshwater Teleost TAG, Bristol Zoological Society, Madagascar National Parks, The Aquatic Population Biology Laboratory of the University of Antananarivo, Madagasikara Voakajy, community ponds association (APPA)

© Aquarium Tropical

AQUATIS AQUARIUM-VIVARIUM LAUSANNE

© Aquatis Aquarium-Vivarium Lausanne

CONSERVATION EFFORTS & OUTCOMES

The Aquatis Aquarium-Vivarium is entirely dedicated to freshwater ecosystems, with all their education activities focused on freshwater topics.

One of the projects concerns a subspecies of the alpine newt (*Ichthyosaura alpestris inexpectata*), which is endemic to a small group of lakes in Calabria, Italy. The numbers of these newts have dropped dramatically over the last 10 years. The action plan aims to help the species through a combination of ex situ breeding with wild caught animals and in situ restoration.

So far, Aquatis had two successful breeding seasons with 42 wild caught newts from three different lakes and ponds in Calabria. In November 2024, 540 juvenile newts were released.

The restoration of the habitat is ongoing (mainly removing introduced fish from the water bodies and the construction of alternative artificial ponds) and further ex situ breeding with another re-introduction is planned for the coming years.

AQUATIS is member of the Freshwater Teleost TAG and coordinating the EAZA EEP of Percidae.

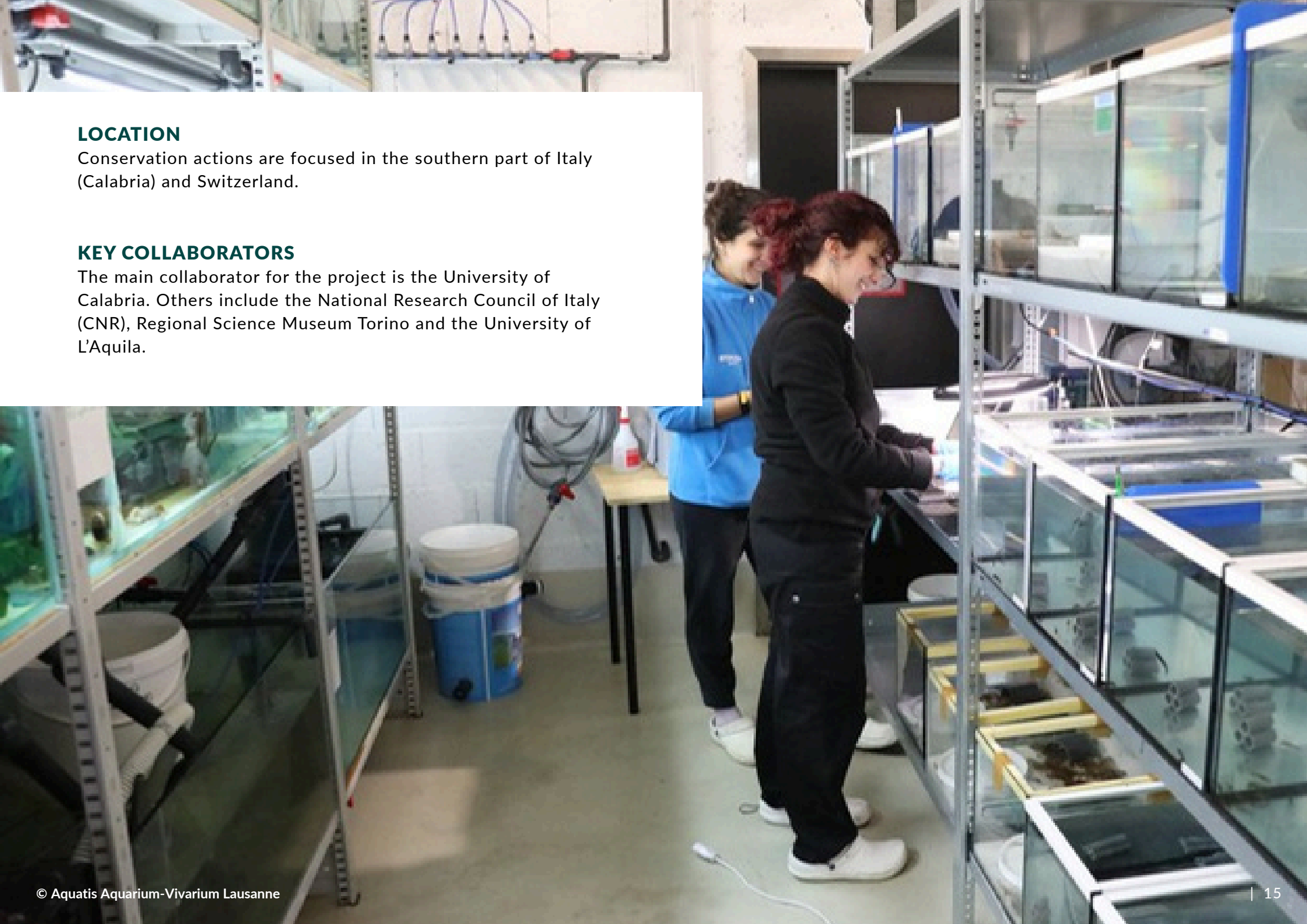
Another ongoing project concerns the endangered Zingel Asper in Switzerland, where Aquatis are working with the Swiss Confederation and other stakeholders.

LOCATION

Conservation actions are focused in the southern part of Italy (Calabria) and Switzerland.

KEY COLLABORATORS

The main collaborator for the project is the University of Calabria. Others include the National Research Council of Italy (CNR), Regional Science Museum Torino and the University of L'Aquila.



BRISTOL ZOOLOGICAL SOCIETY

© Bristol Zoological Society

CONSERVATION EFFORTS & OUTCOMES

Working in partnership with the Hellenic Centre for Marine Research (HCMR), Institute of Inland Waters since 2005 along with ZSL, Bristol Zoological Society started with a focus on saving the Critically Endangered Corfu Killifish, *Valencia letourneuxi*. In 2014 the species was split into two, with a new species, the Peloponnese Killifish, *Valencia robertae*, comprising the most southern populations. Both species remain Critically Endangered due to a combination of threats including over abstraction of freshwater springs, direct and indirect pollution and pesticide use and the direct competition from the alien invasive mosquitofish, *Gambusia holbrooki*.

With over 20 years of successful partnership, the team have undertaken conservation translocations by moving populations under threat to more secure locations, and had good success with proven breeding and recruitment to the new sites. Through a programme of community engagement, local schools were able to follow the team into the field for a live experience showcasing the work of the team. Safety-net populations of both species are held in European zoos and aquariums as well as in the HCMR laboratory. Valuable insight into these species life history, reproduction and interactions with the alien

mosquitofish were made possible only through the establishment of populations in the aquarium and laboratory.

Since its inception in 2005, the team have expanded their collaboration to include a number of other highly threatened species of freshwater endemics with work underway or commencing for Greek Stickleback, Evrotas Chub, Spartan Minnow, Trichonis Goby and Greek Lamprey.

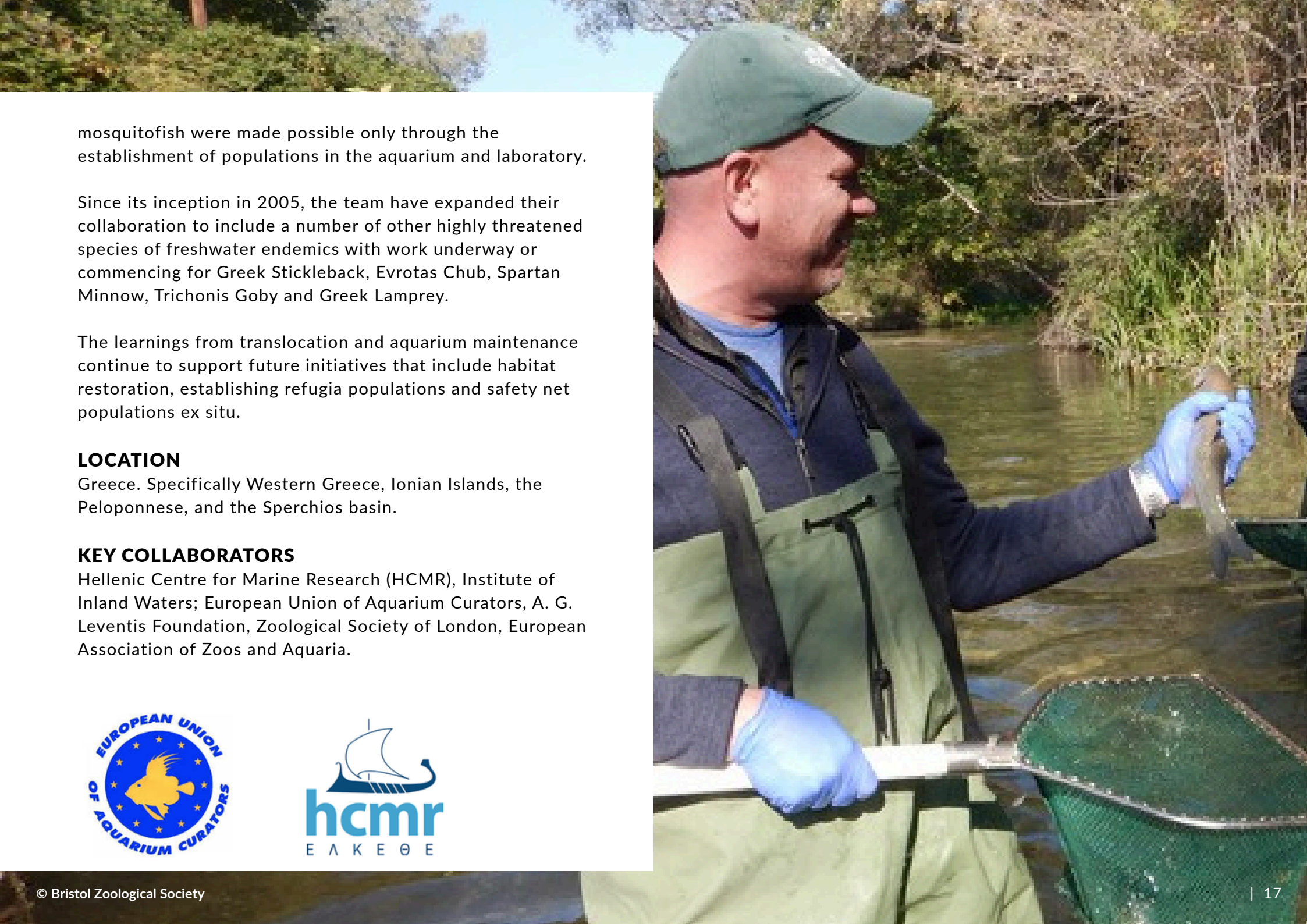
The learnings from translocation and aquarium maintenance continue to support future initiatives that include habitat restoration, establishing refugia populations and safety net populations ex situ.

LOCATION

Greece. Specifically Western Greece, Ionian Islands, the Peloponnese, and the Sperchios basin.

KEY COLLABORATORS

Hellenic Centre for Marine Research (HCMR), Institute of Inland Waters; European Union of Aquarium Curators, A. G. Leventis Foundation, Zoological Society of London, European Association of Zoos and Aquaria.



CHESTER ZOO

Zoogoneticus tequila (Tequila Splitfin) © Max Pedley

Chester Zoo

CONSERVATION EFFORTS & OUTCOMES

Chester Zoo contributes to freshwater conservation through long-term, science-led partnerships that combine species recovery, habitat protection, and community engagement across multiple taxa and regions. A flagship focus is Mexican goodeid conservation (Plan G). Since 2000, Chester Zoo has supported the Mexico Fish Ark at the Universidad Michoacana de San Nicolás de Hidalgo through sustained funding and technical expertise. This partnership led to the landmark 2014 reintroduction of the Extinct in the Wild Tequila Splitfin (*Zoogoneticus tequila*) to the Teuchitlán River, demonstrating the feasibility of freshwater fish recovery at scale.

Building on this success, Chester Zoo co-convened a multi-stakeholder planning workshop in 2022 to develop a national conservation strategy for all Mexican goodeid fishes. The resulting action plan identifies priority conservation sites based on species richness, endemicity, and urgency, and now guides targeted field assessments and in situ interventions.

Chester Zoo also supports the conservation of the Achoque (*Ambystoma dumerilii*), a Critically Endangered salamander endemic to Lake Pátzcuaro. Since 2018, work has combined ecological research, conservation breeding, and strong community partnerships, recognising both the species' ecological role and its cultural importance to the Purépecha people.

In the UK, Chester Zoo has led innovative work on the Scarce Yellow Mayfly (*Isogenus nubecula*), including surveys, riverbank assessments, eDNA monitoring, and the first successful completion of its life cycle in captivity, generating novel behavioural observations and informing future recovery efforts.

Internationally, the zoo contributes to freshwater fish conservation in Lake Chilingali, Malawi, supporting surveys of endemic cichlids following habitat disruption from dam collapse. This work underpins IUCN assessment, species description, and feasibility planning for future reintroduction.

Chester Zoo's work has directly contributed to species recovery from extinction in the wild, improved understanding of threatened freshwater populations, strengthened national and local conservation capacity, and advanced evidence-based planning for reintroductions and habitat restoration.

LOCATION

Mexico, United Kingdom, and Malawi.

KEY COLLABORATORS

Key collaborators include the Mexico Fish Ark, Universidad Michoacana de San Nicolás de Hidalgo, IUCN SSC Freshwater Conservation Committee, SHOAL Conservation, Bangor University, local authorities and community groups in Mexico and Malawi, and international research and conservation partners.

Scarce Yellow Mayfly, *Isogenus nubecula*. © Roland Godon via iNaturalist under C.C. 4.0.

COLUMBUS ZOO AND AQUARIUM

Mussel Release, © Columbus Zoo

CONSERVATION EFFORTS & OUTCOMES

Columbus Zoo and Aquarium and The Wilds have been supporting freshwater conservation around the world and within Ohio for the past three decades. Since 2012, the Columbus Zoo and Aquarium and The Wilds have been leaders in the Ohio Hellbender Partnership, made up of representatives from state and federal agencies, zoos, universities, and conservation NGOs working collaboratively to reverse the decline of this iconic salamander in the state.

In the coming years, the zoo and The Wilds will be expanding conservation work in aquatic ecosystems, particularly focusing on native aquatic conservation projects.

The zoo has reared over half of the 2,000 head-started hellbenders that have been released at 27 sites in 10 Ohio watersheds. In 2023, an individual that was released in 2016 was found guarding a nest of eggs in the wild, an important milestone for the species.

LOCATION

South America, Africa, Asia, Australia, and throughout North America.

Hellbender Release, © Columbus Zoo

KEY COLLABORATORS

Columbus Zoo fosters collaboration at local and international scales. Local conservation efforts also include the creation of the Watters Aquatic Conservation Center, a collaborative endeavor between the zoo, Ohio State University, Ohio Division of Wildlife, and Columbus Recreation and Parks Department. In total, Columbus Zoo and Aquarium has given over USD 300,000 to freshwater conservation efforts and worked alongside a multitude of local, national, and international partner organisations. Inside of the recently opened Ohio Center for Wildlife Conservation, visitors to the zoo can now witness the previously behind-the-scenes rearing of hellbenders and learn more about the ongoing mussel research supported by the zoo.

GREAT LAKES AQUARIUM

© Great Lakes Aquarium

Great Lakes Aquarium has joined an exciting collaboration with the U.S. Fish and Wildlife Service, the Minnesota DNR, and the Fond du Lac Tribal Council, to raise and release Lake Sturgeon (*A. fulvescens*) into the St. Louis River.

While Great Lakes Aquarium has assisted with egg collection at the Sturgeon River spawn site previously, 2026 marks the first year that lake sturgeon will be raised on site at Great Lakes Aquarium.

Their goal is to raise 2,700 Lake Sturgeon to a minimum length of 178mm in their pilot year, and 3,500 sturgeon in subsequent years. Due to their location and ability to use St. Louis River water for raising the sturgeon, they are able to increase chances of effective imprinting, which should allow the fish to navigate back to the St. Louis when sexually mature for spawning.

INDIANAPOLIS ZOO

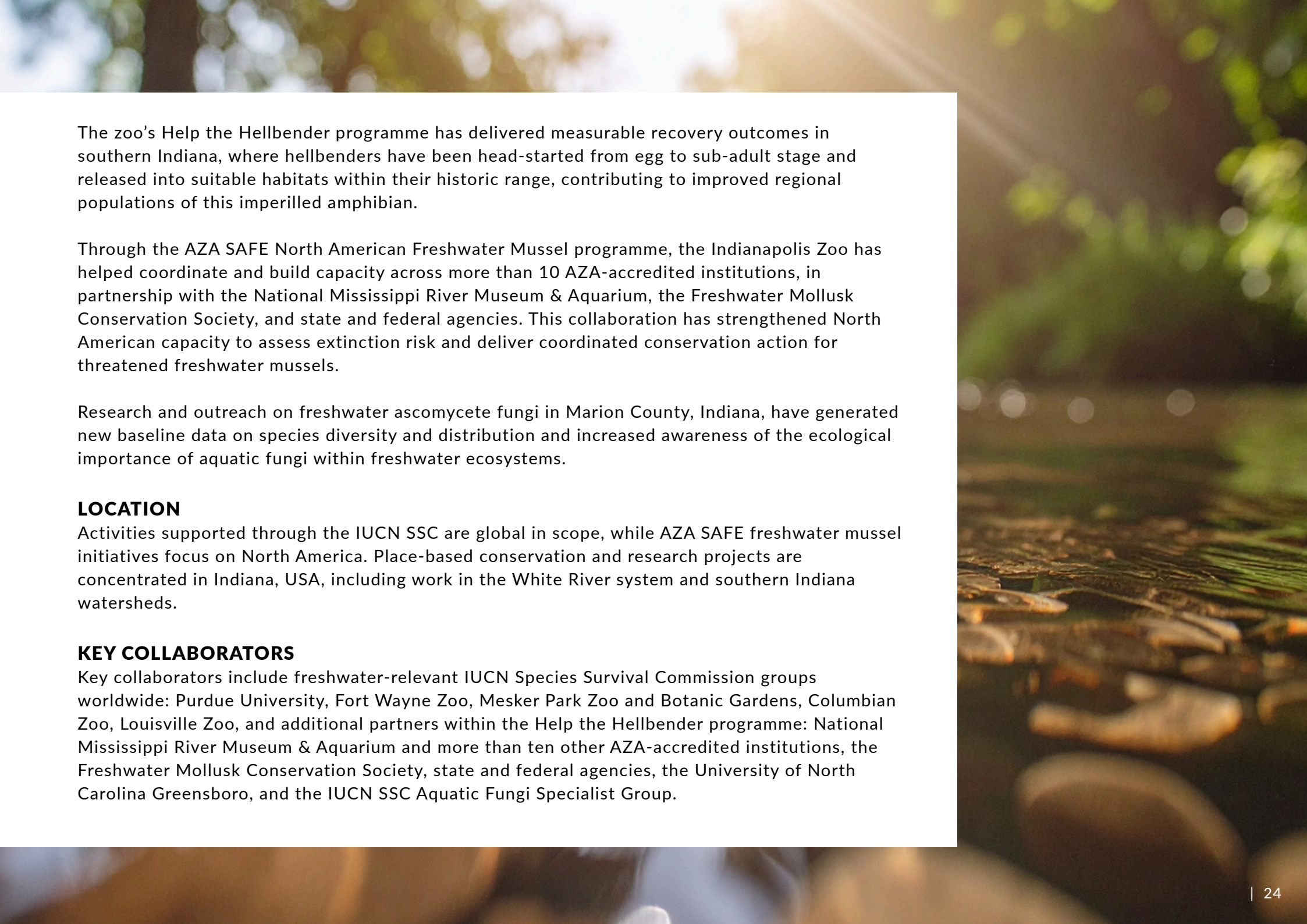
© Jeremy Shelton

CONSERVATION EFFORTS & OUTCOMES

Through its Global Center for Species Survival, the Indianapolis Zoo provides strategic support to the IUCN Species Survival Commission's Freshwater Conservation Committee, as well as selected freshwater Specialist Groups and Task Forces, including the Freshwater Fish Specialist Group and the Aquatic Fungi Specialist Group, to help deliver Red List assessments, conservation planning, and action for priority freshwater species and ecosystems.

In parallel, the zoo provides direct funding support to a range of freshwater conservation initiatives, including projects focused on several threatened species such as the Potosi Pupfish (*Cyprinodon alvarezi*), La Palma Pupfish (*C. longidorsalis*), Charco Palma Pupfish (*C. veronicae*), Clanwilliam Sandfish (*Labeo seeberi*), and Niger Stingray (*Fontitrygon garouaensis*). Locally, the zoo also supports freshwater conservation in Indiana, including ongoing investment in the Muncie Bureau of Water Quality's White River Mussel Propagation Facility.

Through its Global Center for Species Survival, the Indianapolis Zoo has supported the IUCN Species Survival Commission's Freshwater Conservation Committee and associated Specialist Groups, contributing to freshwater Red List assessments and the development of action-oriented conservation plans for priority taxa, including freshwater fishes and aquatic fungi.



The zoo's Help the Hellbender programme has delivered measurable recovery outcomes in southern Indiana, where hellbenders have been head-started from egg to sub-adult stage and released into suitable habitats within their historic range, contributing to improved regional populations of this imperilled amphibian.

Through the AZA SAFE North American Freshwater Mussel programme, the Indianapolis Zoo has helped coordinate and build capacity across more than 10 AZA-accredited institutions, in partnership with the National Mississippi River Museum & Aquarium, the Freshwater Mollusk Conservation Society, and state and federal agencies. This collaboration has strengthened North American capacity to assess extinction risk and deliver coordinated conservation action for threatened freshwater mussels.

Research and outreach on freshwater ascomycete fungi in Marion County, Indiana, have generated new baseline data on species diversity and distribution and increased awareness of the ecological importance of aquatic fungi within freshwater ecosystems.

LOCATION

Activities supported through the IUCN SSC are global in scope, while AZA SAFE freshwater mussel initiatives focus on North America. Place-based conservation and research projects are concentrated in Indiana, USA, including work in the White River system and southern Indiana watersheds.

KEY COLLABORATORS

Key collaborators include freshwater-relevant IUCN Species Survival Commission groups worldwide: Purdue University, Fort Wayne Zoo, Mesker Park Zoo and Botanic Gardens, Columbian Zoo, Louisville Zoo, and additional partners within the Help the Hellbender programme: National Mississippi River Museum & Aquarium and more than ten other AZA-accredited institutions, the Freshwater Mollusk Conservation Society, state and federal agencies, the University of North Carolina Greensboro, and the IUCN SSC Aquatic Fungi Specialist Group.

SAINT LOUIS ZOO

© Saint Louis Zoo

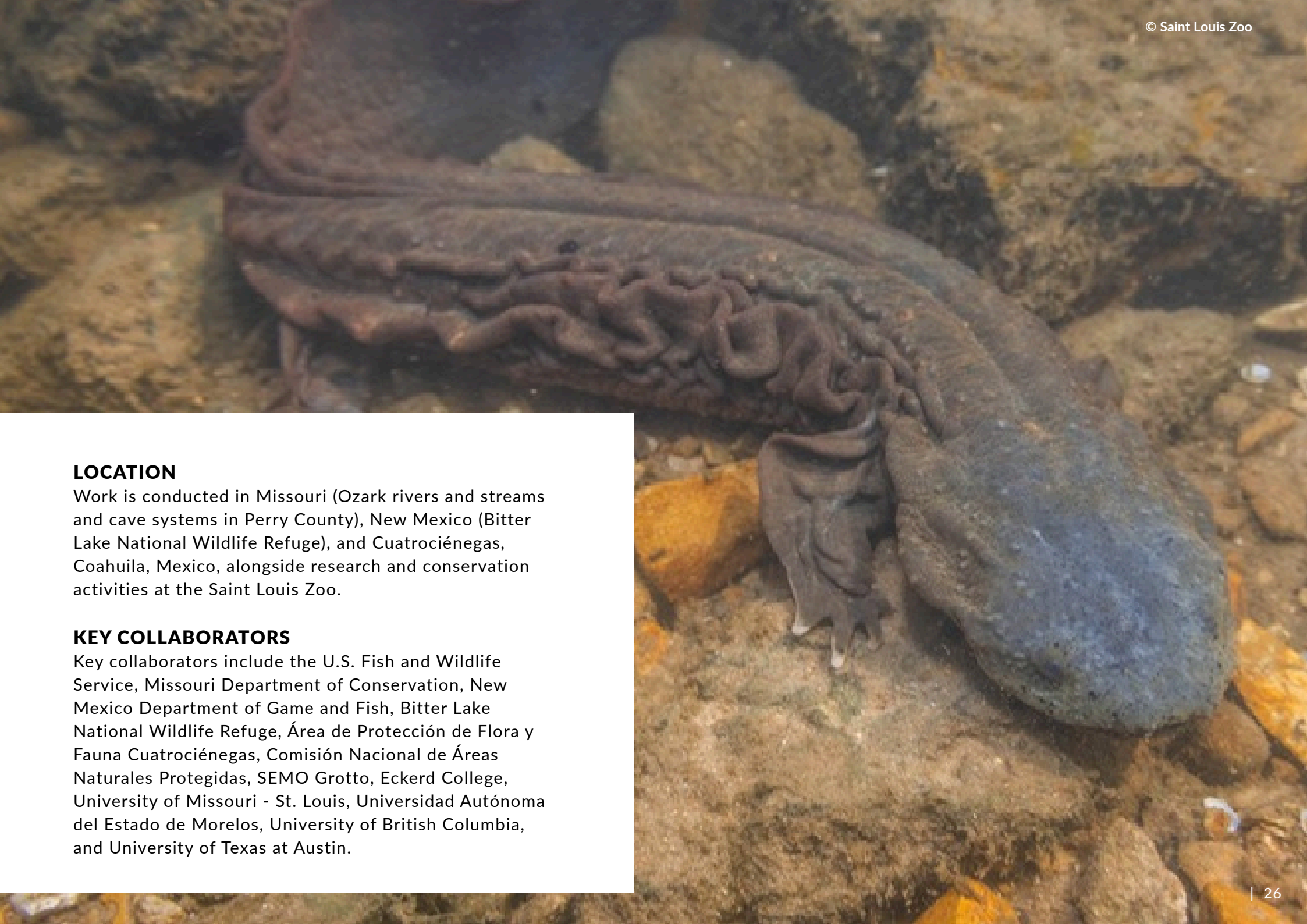
Saint Louis Zoo
Animals Always®

CONSERVATION EFFORTS & OUTCOMES

The Saint Louis Zoo Freshwater Conservation Portfolio advances the protection and recovery of threatened aquatic species and ecosystems through integrated research, managed care, and field-based conservation.

Efforts include breeding, rearing, and head-starting threatened species for release, field surveys and long-term ecological monitoring, conservation genetic analyses, and research on species biology, reproduction, and disease to inform recovery strategies. For example, through the WildCare Institute Ron and Karen Goellner Center for Hellbender Conservation, the zoo has led large-scale recovery efforts for hellbenders (*Cryptobranchus alleganiensis*), releasing more than 12,000 individuals into the wild. The zoo also supports recovery-focused research for the ESA-listed Grotto Sculpin (*Cottus specus*), including cave surveys, population genetics, and managed-care research, as well as conservation research on the ESA-listed Pecos Mosquitofish (*Gambusia nobilis*) to assess habitat requirements, population health, genetic resilience, and threats from environmental change and invasive species.

In Mexico, the zoo collaborates on research and conservation in Cuatrociénegas, a globally significant desert oasis, contributing to studies of endemic aquatic species, invasive species impacts, and local capacity building.



© Saint Louis Zoo

LOCATION

Work is conducted in Missouri (Ozark rivers and streams and cave systems in Perry County), New Mexico (Bitter Lake National Wildlife Refuge), and Cuatrociénegas, Coahuila, Mexico, alongside research and conservation activities at the Saint Louis Zoo.

KEY COLLABORATORS

Key collaborators include the U.S. Fish and Wildlife Service, Missouri Department of Conservation, New Mexico Department of Game and Fish, Bitter Lake National Wildlife Refuge, Área de Protección de Flora y Fauna Cuatrociénegas, Comisión Nacional de Áreas Naturales Protegidas, SEMO Grotto, Eckerd College, University of Missouri - St. Louis, Universidad Autónoma del Estado de Morelos, University of British Columbia, and University of Texas at Austin.

SHEDD AQUARIUM

© Shedd Aquarium

CONSERVATION EFFORTS & OUTCOMES

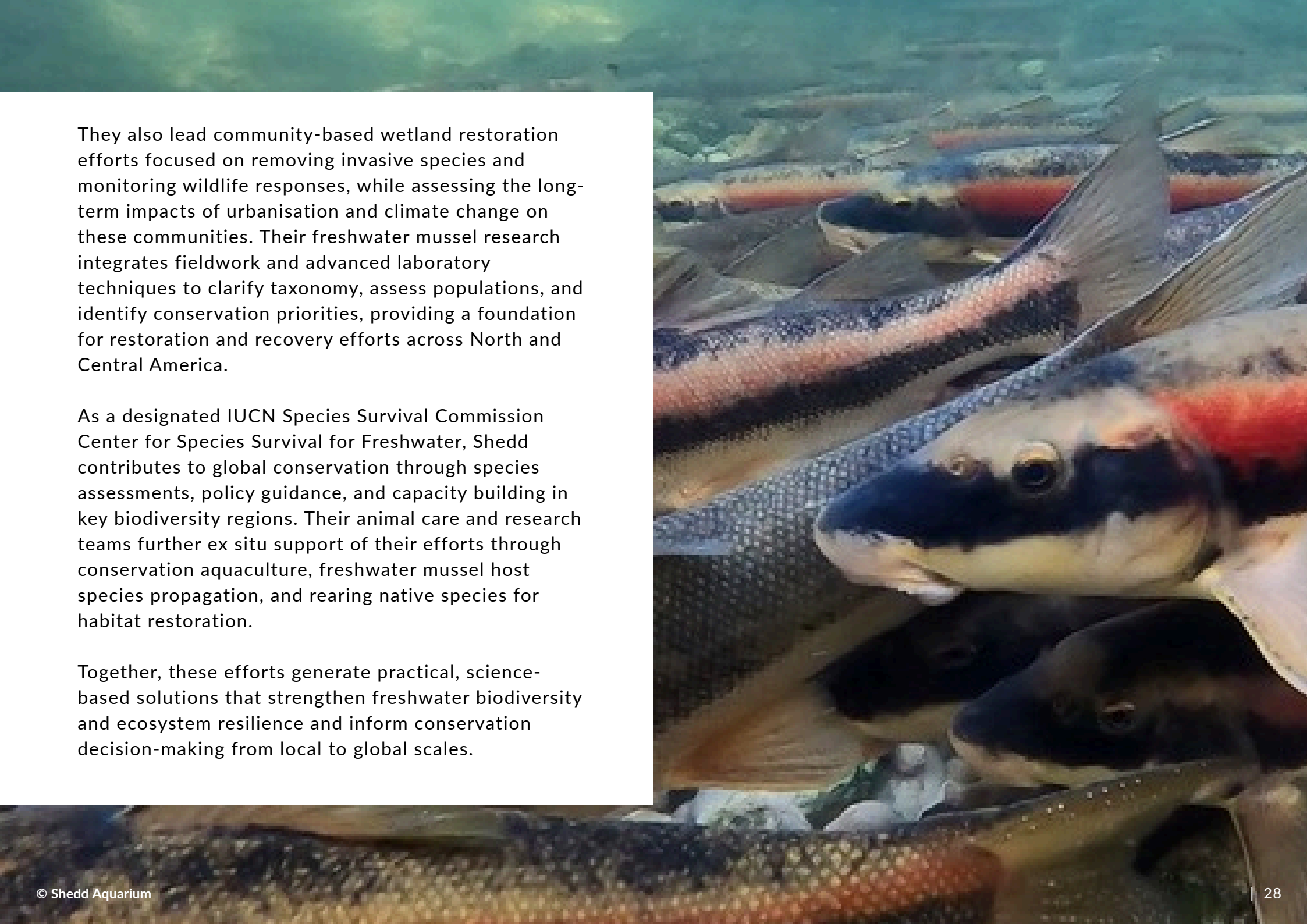
Shedd Aquarium's freshwater conservation programme integrates interdisciplinary in situ and ex situ science, participatory action, and community engagement to advance conservation, inform policy, and improve outcomes for freshwater biodiversity. Through applied research, strategic partnerships and activation, and training opportunities, the programme drives both immediate conservation action and the development of the next generation of freshwater scientists.

Their work spans several interconnected focus areas. In the Great Lakes, they fill critical management gaps by studying underappreciated migratory fishes to understand how species respond to habitat fragmentation and climate change, generating insights that inform conservation efforts both regionally and globally. In the Chicago River, Shedd collaborates with partners and community members to reimagine and restore urban waterways. By implementing and evaluating innovative habitat enhancements, including floating wetlands, they are helping to restore ecological function in highly modified aquatic systems.

They also lead community-based wetland restoration efforts focused on removing invasive species and monitoring wildlife responses, while assessing the long-term impacts of urbanisation and climate change on these communities. Their freshwater mussel research integrates fieldwork and advanced laboratory techniques to clarify taxonomy, assess populations, and identify conservation priorities, providing a foundation for restoration and recovery efforts across North and Central America.

As a designated IUCN Species Survival Commission Center for Species Survival for Freshwater, Shedd contributes to global conservation through species assessments, policy guidance, and capacity building in key biodiversity regions. Their animal care and research teams further ex situ support of their efforts through conservation aquaculture, freshwater mussel host species propagation, and rearing native species for habitat restoration.

Together, these efforts generate practical, science-based solutions that strengthen freshwater biodiversity and ecosystem resilience and inform conservation decision-making from local to global scales.



LOCATION
United States, Mexico, Central America

KEY COLLABORATORS
IUCN Species Survival Commission, IUCN SSC Freshwater Conservation Committee, IUCN SSC Mollusc Specialist Group, IUCN Freshwater Biodiversity Unit, Reverse The Red, U.S. Fish and Wildlife Service, DuPage County Forest Preserve District, University of Costa Rica, Ministry of Environment and Natural Resources of El Salvador, University of San Carlos of Guatemala, Universidad Nacional Autónoma de Honduras, Urban Rivers.

ZOOLOGICAL SOCIETY OF LONDON

Potosi Pupfish, © Josh More

CONSERVATION EFFORTS & OUTCOMES

Zoological Society of London (ZSL) cares for a wide range of Endangered through to Extinct in the Wild freshwater fish species. As well as leading the *Cyprinodontidae*, *Aphaniidae* and the *Aplocheilidae* EEP, there are several other ex situ programmes that ZSL supports such as *Valencidae*, *Cichlidae*, *Goodeidae*, *Bedotiidae*, and *Poecilidae*. Primarily working in Mexico and Turkey, ZSL supports both endemic pupfish (*Cyprinodon*) and killifish (*Anatolichthys*) respectively linking both ex situ and in situ initiatives with local partners, universities and NGO's. Led by ZSL, the Transforming the Thames is a collaboration between conservationaists, local communities, government bodies and landowners in a pioneering mission to restore key habitats across the estuary. ZSL also leads on and supports a number of freshwater conservations projects such as the European Eel (*Anguilla anguilla*).

ZSL has worked with over 12 partners to create a Mexican Pupfish Recovery Plan. This work focuses on the conservation and recovery of three freshwater fish species currently classified as Extinct in the Wild: the Potosí Pupfish (*Cyprinodon alvarezi*), La Palma Pupfish (*Cyprinodon longidorsalis*), and Charco Palma Pupfish (*Cyprinodon veronicae*). These species are endemic to isolated spring systems in Nuevo León, México, and were lost from the wild primarily due to groundwater overexploitation and habitat desiccation.

The partnership has developed and is implementing a coordinated Conservation Action Plan (2024–2029) that integrates ex situ population management, habitat restoration, conservation translocation planning, applied research, and community engagement. Key efforts include the long-term maintenance and genetic management of global assurance populations under the EAZA Ex Situ Programme (EEP), led by the ZSL.

The programme strengthens demographic and genetic security across multiple holders to reduce extinction risk under human care. In parallel, the initiative supports feasibility assessments and planning for spring rehabilitation and future reintroductions, aligned with the IUCN Guidelines for Reintroductions and Other Conservation Translocations. The project also places strong emphasis on education and awareness, working with zoos, aquaria, and academic institutions to reconnect local communities with their freshwater biodiversity and promote sustainable water stewardship.

To date, these efforts have prevented global extinction of all three species, maintaining viable ex situ populations numbering in the hundreds. The partnership has established a robust governance and management framework for Extinct in the Wild freshwater fishes, informed by lessons from previous successful reintroductions, including the Tequila Splitfin. Planned outcomes include restored spring habitats, pilot conservation translocations, strengthened national capacity for freshwater fish conservation in Mexico, and progress toward IUCN Red List downlisting through demonstrated recovery potential.

LOCATION

Conservation actions span Mexico, particularly the state of Nuevo León (historic and future recovery sites), alongside coordinated ex situ management in the United Kingdom, Austria, and the United States. Research, training, and policy engagement also operate at an international scale through global conservation networks.

Top to bottom: Charco Palma Pupfish, Potosi Pupfish, La Palma Pupfish © Barbara Nicca

KEY COLLABORATORS

This work is delivered through a diverse, interdisciplinary partnership including Zoological Society of London, Universidad Michoacana de San Nicolás de Hidalgo, Bristol Zoological Society, Universidad Autónoma del Estado de Morelos, Universidad Autónoma de Nuevo León, Instituto Mexicano de Tecnología del Agua, IUCN Species Survival Commission Conservation Translocation Specialist Group, San Antonio Zoo, Vienna Zoo, Acuario Inbursa, Guadalajara Zoo, RioVivo / Gran Acuario Mazatlán, University of California, Berkeley, and the University of the West of England. Together, these partners combine scientific expertise, conservation practice, education, and policy leadership to support the long-term recovery of Mexico's Extinct in the Wild freshwater fishes.

JOIN THE ALLIANCE

Let's together amplify and elevate conservation of freshwater fishes.

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