Amazon Forgotten Fishes

Celebrating the Amazon's spectacular fishes, their connection to people, and the recovery plan to conserve them

Executive Summary

General coordination
Fernanda Silva, The Nature Conservancy *

Project management
Maria Laura Piñeiros, The Nature Conservancy *

Technical editing
Fernanda Silva, The Nature Conservancy *
Guillermo Estupiñan, Wildlife Conservation Society *
Pedro Jimenez, The Nature Conservancy *
Silvia López-Casas, Wildlife Conservation Society *
Vanessa Rodríguez, Instituto del Bien Común *

Contributing authors
Adela Ruiz, Instituto de Investigaciones de Amazonia Peruana
Allison Aldous, The Nature Conservancy
Andrea Encalada, Universidad San Francisco de Quito *
Angélica María Torres-Bejarano, Universidad Nacional de Colombia
Blanca Ríos Touma, Universidad San Francisco de Quito
Belisario Carrera, Shahuaya community, Peru
Carlos Edwar de Carvalho Freitas, Universidade Federal da Amazônia
Carolina Doria, Ministério da Pesca e Aquicultura
Cecile Brugere, The Nature Conservancy
Celine Jézéquel, AmazonFish
Daniel Crepaldi, Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis
Daniela Rosero López, Universidad San Francisco de Quito *
David McGrath, Sapopema *
Edwin Agudelo, Instituto SINCHI
Elizabeth Anderson, Florida International University *
Enrique Moya, Kichwa Zancudo Cocha Community, Ecuador
Fany Kuiru Castro, Coordinadora de las Organizaciones Indígenas de la Cuenca Amazónica
Fernanda Silva, The Nature Conservancy *
Flávia Loures, The Nature Conservancy *
Gabriela Echevarria, Universidad de la Américas
Guido Herrera, University of Tennessee
Guillermo Estupiñán, Wildlife Conservation Society *
Jansen Zuanon, Instituto Nacional de Pesquisas da Amazônia (Retired)
Javier Del Aguila, Proyecto VASI
Javier Zavaleta, Instituto del Mar del Perú
Jonathan Valdiviezo-Rivera, Instituto Nacional de Biodiversidad *
Jorge Abad, Red Yaku
Juan David Bogotá, Instituto SINCHI
Leandro Sousa, Universidade Federal do Pará
Luis Moya, Wildlife Conservation Society *
Marcelo Ândrade, Universidade Federal do Pará
Mariana Montoya, Wildlife Conservation Society *
Mariana Paschoalini Frias, WWF-Brazil
Mary Pleasant, The Nature Conservancy
Mauro Ruffino, Organización del Tratado de Cooperación Amazónica
Michael Goulding, Wildlife Conservation Society (Retired)
Pedro Jimenez, The Nature Conservancy *
Raúl Pardo, Autoridad Nacional de Acuicultura y Pesca, Colombia
Rodrigo M. Salles, Untamed Angling
Ronaldo Barthem
Rosa Elena Ajiaco Martínez, Universidad de los Llanos
Rosa Vento, Wildlife Conservation Society
Rubí Cahuachi, Yagua community, Peru
Sandra Bibiana Correa, Mississippi State University *
Saulo Usma, WWF-Colombia
Sebastian A. Heilpern, Stanford University *
Shiteng Kang, The Nature Conservancy
Silvia Benitez, The Nature Conservancy *
Silvia López-Casas, Wildlife Conservation Society *
Simone Athayde, World Resources Institute
Sui Phang, The Nature Conservancy
Victoria Isaac, Universidade Federal do Pará

* Amazon Waters Alliance

Design
Karla Vazquez

General editing
Evan Jeffries

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Cover image by Confucio Hernández Makuritofe, an Indigenous researcher and artist from the Muina Nipode people of the Colombian Amazon. His work integrates cultural research, illustration, and ancestral knowledge of Amazonian flora and fauna, contributing to the visibility of Indigenous knowledge and awareness of biodiversity.

Across the vast sweep of the Amazon Basin, thousands of rivers, streams and floodplain lakes flow in an immense, interconnected waterscape—home to an unparalleled diversity of freshwater fishes. More than 2,700 species have so far been recorded, with dozens more added each year as scientific exploration continues.

This report dives beneath the surface to reveal their life histories, including their range and variety, the roles they play in the ecosystem, their adaptations and their niches. It also explores their place in human society, since millions of people across the Amazon rely on fish for food and livelihoods, and they have a unique place in the sociocultural heritage, histories and identities of Indigenous Peoples and local communities throughout the basin.

Two-thirds of the freshwater fishes in the Amazon are found nowhere else on Earth. This exceptional endemism is reflected in a dazzling range of species. Some are giants: the legendary pirarucu, for example, can reach a length of up to 3 m and tip the scales at 200 kg. Others are giants of movement: the 'goliath catfishes' are renowned for their long migrations, with the dourada known to travel more than 11,000 km in a migratory odyssey from the foothills of the Andes to the Atlantic Ocean and back.

The Amazon is also home to tiny neon tetras, jewel-like dwarf cichlids, razor-toothed piranhas, electric eels that hunt in packs, blind fish that inhabit saturated soil below the forest floor, and transparent candiru that drink blood from the gills of unwitting hosts. All of these species live in the connected hydrological system of white- black- and clearwater rivers, of seasonally flooded forests and richly varied habitats.

+2,700

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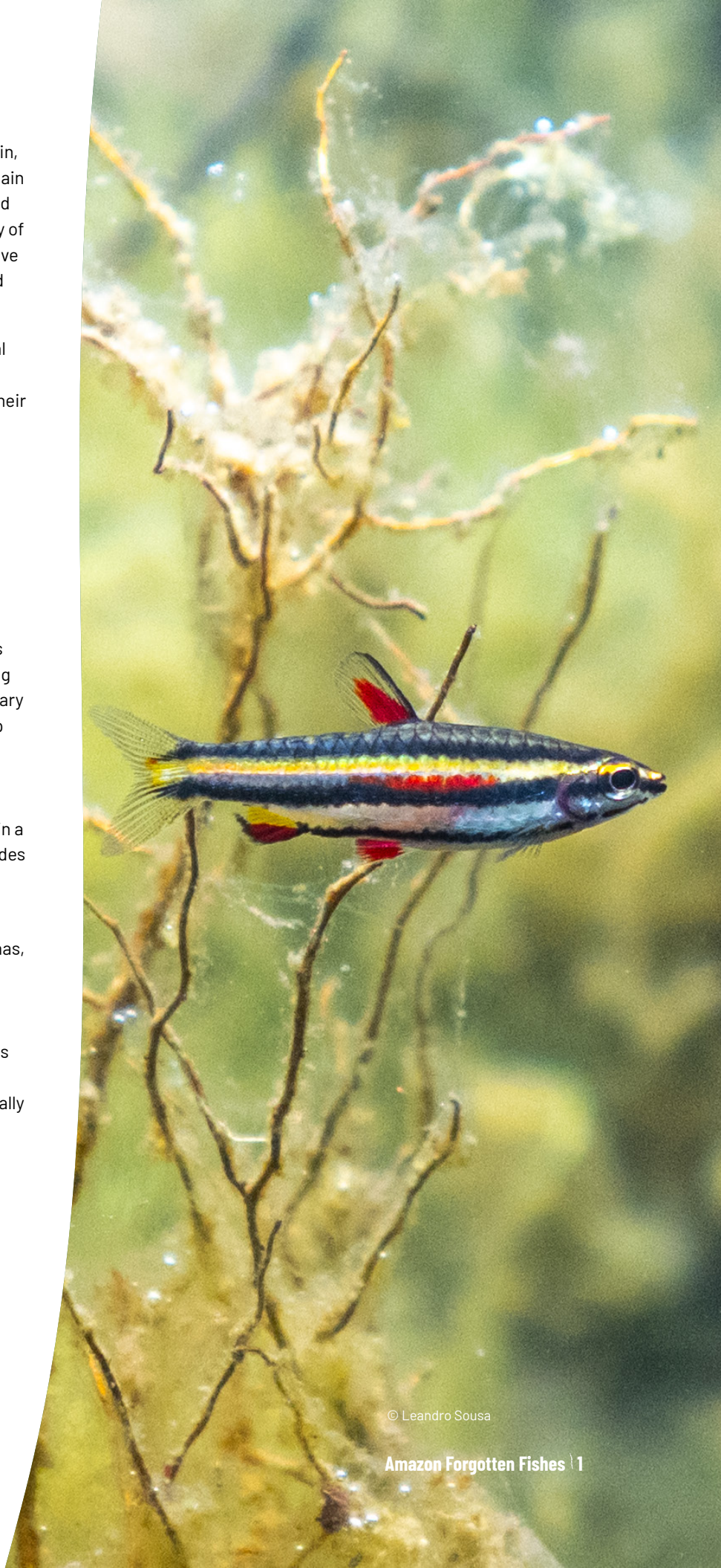

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The fishes of the Amazon Basin are vital for its ecosystems. When the tambaqui and many other species migrate into flooded forests to feed on fallen fruits, they spread seeds across enormous areas, helping to regenerate tree cover. Other species act as mobile nutrient pumps, regulating primary production and supporting predators higher up the food web. In addition to holding the world's greatest diversity of freshwater fish, the Amazon Basin hosts the highest global richness of freshwater megafauna, including large catfishes, river dolphins and giant otters, that depend on fish as their primary prey.

These same ecological processes that sustain biodiversity also underpin human well-being across the basin. Amazonian fishes are also dietary staples, with consumption topping 600 g per person per day in some remote riverine communities—the equivalent of two large fillets daily. For low-income households in particular, fish are among the most affordable and reliable animal-source foods, providing essential nutrients that support healthy blood and the immune system, brain and heart development, and overall growth.

Taken together, this extraordinary diversity and ecological complexity underscore why Amazonian fishes matter not only to nature, but to people as well through the many ways fisheries sustain livelihoods, economies and cultural identities throughout the Amazon Basin.

Scarce data capture only part of the Amazon's extensive inland fisheries, as these are sustained largely by artisanal, small-scale and subsistence fishers whose catches rarely appear in statistics. Nonetheless, even the most conservative estimates show that at least 200 species are commercially harvested. Fishers use a wide variety of gears, designed to target specific species under local environmental conditions. At least 15 types of gear are documented across the basin, most of

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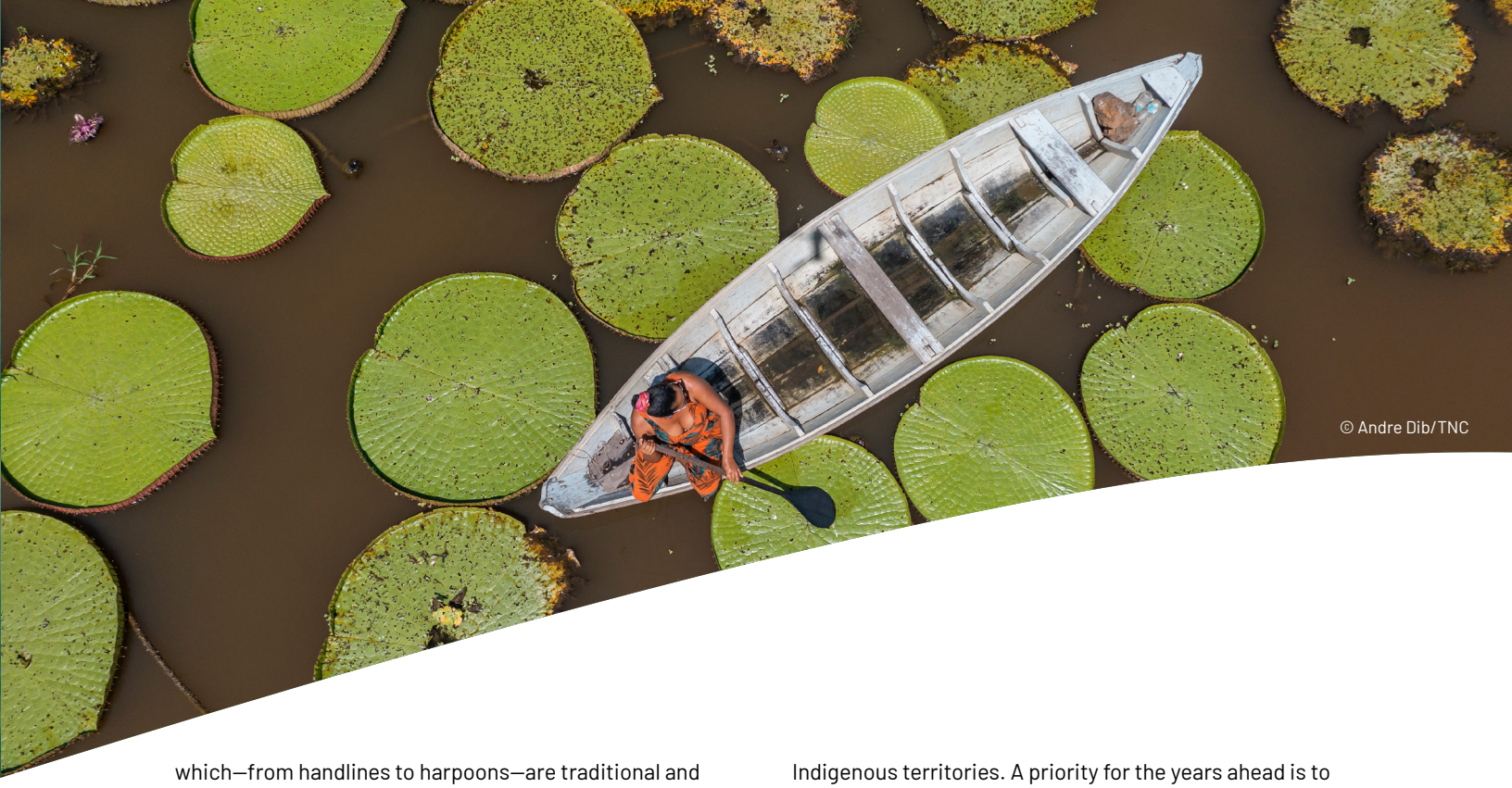

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which—from handlines to harpoons—are traditional and environmentally sustainable.

That said, not all Amazonian fisheries are targeted for the table. Hundreds of vividly colored and uniquely shaped ornamental species are captured alive for international export, ending up in aquariums all over the world. The most commonly traded species are familiar to amateur enthusiasts everywhere such as tetras, oto catfish, and arawanas—while other species require special permits for their sale, including some freshwater stingrays. Although the rise of captive breeding programs has transformed global markets in recent decades, the sector still exports tens of millions of individual fishes each year and supports thousands of livelihoods, so its continued sustainable management is critical. Notably, women are pivotal in the Amazon's ornamental fisheries, involved at every stage of the supply chain and playing very active roles in community associations.

Sport fishing, too, can provide valuable income for local communities, with well-managed catch-and-release tourist packages potentially raising more money in a week than could be raised in a year of commercial fishing in the same waters. Increasing numbers of sport fishers are visiting the Amazon, keen to pit their skills against peacock bass, large catfishes and other iconic trophy species. Many of the well-preserved, species-rich rivers that offer the best sporting experiences are in remote regions, and often in protected areas or Indigenous territories. A priority for the years ahead is to ensure that the sector's expansion remains sustainable, and that local communities are closely involved in its management and share fairly in its benefits.

But here's the issue: everything the fishes of the Amazon provide for the region itself and the wider world beyond—freshwater benefits, food and livelihoods, cultural heritage, wonder and delight—depends on them continuing to thrive. And for decades, in the Amazon, nature has been under attack. The International Union for Conservation of Nature (IUCN) lists 144 Amazonian fishes on its Red List of Threatened Species, and 334 other species are listed as Data Deficient. The true number is likely much higher. Geographic and institutional gaps in national records, coupled with the absence of coordinated, cross-border collaboration, leaves further critical blind spots, making sustainable management much harder.

So why are so many species at risk? The answer is not a surprising one. Freshwater biodiversity in the Amazon is increasingly threatened by several major drivers, and all of them are the direct result of human activities. Most obviously, freshwater habitats are being degraded and destroyed at an unprecedented rate. Dams, drainage and diversions are all on the rise in the region, fundamentally transforming freshwater ecosystems by fragmenting their connections and changing the flow patterns that are crucial to fishes' life histories, physiologies and

behaviors. Deforestation driven by agriculture, ranching, hydropower and infrastructure disrupts reciprocal relationships between trees and fruit-eating species, and quite literally muddies the waters the fishes swim in, limiting light penetration and clogging their gills. Pollution from other sources, including mining and oil extraction, can severely impair fish feeding, growth, reproduction and survival, while releasing contaminants such as mercury (a potent neurotoxin) that move through the food chain and pose risks to human health.

Overfishing has been increasing since the 1970s, due to a lack of effective management, monitoring and enforcement systems. Regional studies are showing a reduction in the average size of fish landings, particularly of larger, more economically valuable species. As the makeup of fish communities changes, opportunities emerge for non-native species to establish themselves, which further disrupts freshwater ecosystems.

Intensifying the impact of all these threats is climate change, with consistent warming and significant changes in river flows projected through to 2050. In broad terms, as the planet heats, water in Amazonia will become scarcer, particularly during the dry season, which will hit floodplain species and the communities that rely on them particularly hard. Mountain streams are expected to be most affected, where warming waters will drive local extinctions of many endemic species.

Is the situation a hopeless one? Admittedly, in the face of so many daunting challenges, it would be easy to think that there's not much we can do to save the forgotten fishes of the Amazon Basin. But we already know what needs to happen to help these fish thrive—nations in the region need to put into practice the principles of the global Emergency Recovery Plan for Freshwater Ecosystems, based on six urgent and coordinated actions:

- **Let rivers flow more naturally**
- **Protect free-flowing rivers**
- **End unsustainable management of resources**
- **Protect and restore critical habitats and species**
- **Prevent and control invasions by non-native species**
- **Improve water quality in freshwater ecosystems**

There are unique opportunities to adapt and enhance these actions to the situation in the Amazon where water, sediments, nutrients and fishes respect no political borders. Safeguarding the fishes and freshwater ecosystems they inhabit requires a paradigm shift away from isolated national strategies and towards a unified, transboundary collaboration and governance framework. This must be anchored in collective action at a basin-wide scale led by governments working hand-in-hand with academia, the private sector, civil society and, importantly, with the Indigenous Peoples and local communities whose daily lives are intimately linked to its natural cycles. Indeed, their central role is critical: the formal recognition of their stewardship and their significant traditional knowledge amplifies the potential for positive change.

Ultimately, this report demonstrates that the fate of the forgotten fishes of the Amazon relies on our ability to see the basin as they do: as one indivisible, flowing entity. By combining ancestral stewardship and knowledge with modern science, global engagement, robust transboundary governance and collective action to manage cumulative impacts, we can ensure that the Amazon remains a connected and thriving freshwater system far into the future.

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Learn more about the forgotten fishes of the Amazon at
http://nature.org/pecesolvidadosamazonia

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