

Freshwater

Photo: Michel Roggo

Why Freshwater?

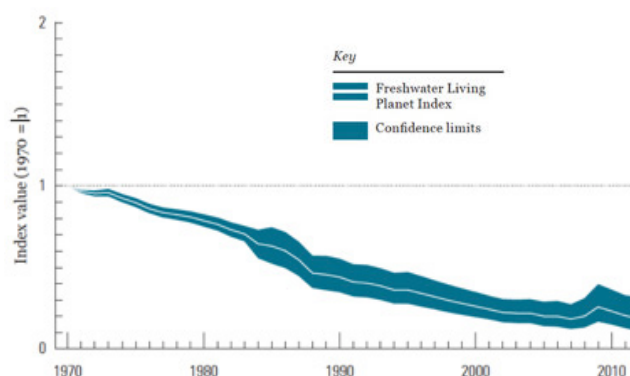
"Once there were brook trout in the streams in the mountains. You could see them standing in the amber current where the white edges of their fins wimpled softly in the flow. They smelled of moss in your hand. Polished and muscular and torsional. On their backs were vermiculite patterns that were maps of the world in its becoming. Maps and mazes. Of a thing which could not be put back. Not be made right again. In the deep glens where they lived all things were older than man and they hummed of mystery." – Cormac McCarthy, The Road.

Rivers, lakes and wetlands form an amazing ecosystem which covers less than 1% of the Earth's surface, yet is home to almost 10% of all known species and fundamental to the lives of terrestrial species.

For many of us rivers and wetlands are places of adventure or contemplation. Above the surface, we are enchanted by the aerial wizardry of dragonflies or the soulful warble of a rushing river - whilst below the water's surface lie less visible but equally remarkable species; dolphins and sharks which have adapted to freshwater environments, fish adorned with kaleidoscopic colour, and plants which survive by clinging on to rocks in rapid flowing riffles.

Freshwater species comprise fish, mammals, waterbirds, molluscs, invertebrates, plants, reptiles and amphibians. These species are adapted to a specific set of environmental conditions such as local water temperature, depth and rate of flow, but rapid changes to these conditions have triggered a serious decline in both their abundance and their diversity. The Living Planet Report 2016, produced by the World Wide Fund for Nature (WWF)¹, highlighted the plight of these ecosystems around the world. Of the freshwater species included in the analysis, populations were recorded to have fallen by a jaw-dropping 81%, whilst the extinction rate of these species is estimated to be four to six times higher than that for marine and terrestrial species.²

As the graph below demonstrates, not only is the decline in freshwater species' abundance abrupt, but it impacts a huge range of species. A rare example



Trend in population abundance for 3,324 populations of 881 freshwater species monitored across the globe between 1970 and 2012. (WWF/ZSL, 2016)

of a freshwater species hitting the headlines was the predicted loss of the Yangtze river dolphin (or Baiji) – it was the first large vertebrate in over 50 years to become extinct. Meanwhile other groups such as amphibians, which are the most threatened taxonomic group globally, rely on freshwater systems for at least part of their life cycle. Regrettably, the data paints a picture of stressed freshwater systems and disappearing freshwater life.

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Challenges: Declining species, damaged ecosystems

This species decline is, unsurprisingly, intricately connected to the wide-scale changes which freshwater ecosystems have undergone in the past century. People have a long history of engineering natural water systems, however as the global population has risen and industrial use of water has increased, freshwater systems have moved further and further away from the natural conditions in which species have evolved. Freshwater ecosystems have often been under-valued habitats, cleared for agriculture and drained for new developments. The extent of wetland ecosystems declined by 64-71% during the 20th century, and since the turn of the century this downward trend has continued.³ Rivers have also become recipients of a growing array of pollutants, the impact of which is magnified as they flow across river basins and

A key dynamic in the state of freshwater systems has been the widespread construction of hydropower and irrigation dams, resulting in the fragmentation of river systems and transformation of habitats. Dams can serve important functions, however their dramatic proliferation over the past century has seen more than 57,000 large dams built globally.⁹ If all dams currently planned are also built, 93% of natural hydrological flows will have been altered.¹⁰ Dams change local environmental conditions, flooding upstream areas and often reducing flows downstream, and are also associated with a transition towards slower flowing, deeper water environments. The fragmentation of the river also isolates populations, with particularly negative impacts for migratory species.¹¹

When these changes to wetland ecosystems are paired with other drivers of freshwater biodiversity loss such as the introduction of invasive species, overexploited fisheries, large-scale changes to watersheds and the impacts of climate change it is easy to understand why freshwater species seem to be in so much trouble.

Beyond Freshwater

The impacts of changes to freshwater ecosystems are not confined to these systems alone - they are critically connected to the health of mountain, forest, grassland and coastal environments. As just one example demonstrates, sediment transported downstream by rivers provides nutrients which enrich deltas such as the Mekong, producing some of the most fertile soils on the planet. Transported sediment is also key to large coastal carbon stores, such as the Congo plume, and there are close ties between the quality of water discharged into the ocean, and the health of biodiverse coastal ecosystems such as coral reefs and seagrass beds - relationships which imbue an even greater value to freshwater ecosystems.

ultimately, into the oceans.⁴ It is estimated that 80% of the world's wastewater is currently released back into the environment without treatment (UNEP 2017).⁵

A further key challenge is the increasing amount of freshwater abstracted from rivers and lakes, with withdrawals tripling in the past 50 years.⁶ This has seen flowing torrents transformed into trickling streams, large lakes wither into shallow pools. As a result vast areas suffer from heightened water scarcity, something which is anticipated to increase as the impacts of climate change intensify over the next century. In fact, in 2015 water risk was ranked as the most severe global risk in terms of its potential to impact political, social and economic security over the next ten years⁷, and there exists a strong correlation between areas experiencing human water stress and regions where flow regimes have been altered from natural conditions.⁸

The Other Human Element

In many parts of the world people's lives are entwined with the cycles of the freshwater ecosystems. Rivers irrigate around 40% of the world's crop production and along with lakes provide fish protein for the nutritional equivalent of 158 million people, mostly in the developing world.¹² They are essential to our lives and we are putting them under increasing stress. Indeed, in these communities, water is often not only a source of instrumental value - but holds social, cultural and spiritual significance.¹³ The Thai translation for river - 'mae nan' - captures this relationship beautifully; it simply means 'mother water'. Sadly, declining ecological health due to increased industrial water use often has the most damaging impacts on adjacent communities, whilst benefits are experienced by more distant and powerful actors.





Given the diversity of the threats, the importance of freshwater to life on Earth, and the current state of these ecosystems, the crisis in freshwater is unquestionably one of the great environmental challenges of our time – but it is one we are yet to respond to effectively.

Knowledge into Action

Given the range of data that tells us that we are losing freshwater life – what is being done to protect it?

Currently this hidden habitat has received far less attention than marine and terrestrial species. Analysis from the European Foundation Centre shows that freshwater systems as a whole receive just 3.2% of the environmental funding provided by European foundations. Across the Atlantic, North American Foundations give around 8% of their environmental funding to freshwater work however, our own analysis showed more than 84% of this funding remains in North America. The total number of NGOs working on this issue is also small – only a handful of international NGOs are dedicated to working on the conservation of freshwater habitats and species. Even when included in NGOs' activities, freshwater is often a peripheral programme – receiving fewer resources and less attention.¹⁴

Against this backdrop of rapid decline in freshwater biodiversity compounded by low levels of awareness and support for freshwater conservation, Synchronicity Earth began to focus on this overlooked ecosystem in 2012. We have since supported a range of partners, from scientific units assessing the conservation status of freshwater species, to grassroots advocacy groups protecting their local river systems.

However, we recognise that not enough is being done to prevent the loss of freshwater species. We are therefore currently working to develop a new freshwater programme which aims to support existing initiatives and establish new partnerships, bringing together funders and connecting organisations working on the conservation of freshwater ecosystems. Through this programme Synchronicity Earth aims to pursue its vision:

Vision

A coordinated, international response to the crisis of biodiversity loss in freshwater, and sustainable management and appreciation of freshwater ecosystems, and all the life they support.

Positive Change

This lack of funding and focus is slowly being recognised and we can take some hope from the following:

1. At The International Union for the Conservation of Nature (IUCN) World Congress in 2016, which brought together scientists, NGOs and funders from around the world, a motion succeeded in highlighting the need to integrate freshwater biodiversity across the IUCN Programme.
2. The Key Biodiversity Areas (KBAs) partnership, which aims to better integrate the conservation of important natural sites into policy and planning processes, is also an initiative which could significantly improve protections for freshwater species.
3. The inclusion of sustainable water management (Goal 6) and the protection of global biodiversity (Goals 14 and 15) in the 2030 UN Sustainable Development Goals provides a further opportunity to propel freshwater biodiversity onto the global agenda. However, the SDG framework demonstrates how freshwater species often sit in the nexus between human water needs (Goal 6), life on land (Goal 15) and life in the Oceans (Goal 14).
4. Some practical conservation successes also give cause for hope. The cancellation of the Sao Luiz Do Tapajos Dam in Brazil and the legal protection afforded to rivers in India and New Zealand are meaningful steps to conserve important river systems.

However, what is really needed to catalyse further action and build on some of these more promising developments is a greater awareness of the challenges facing freshwater systems in all sections of society and recognition that we need to protect Earth's vibrant, biodiverse, and life-giving freshwater ecosystems.

Insight Series: Bringing Conservation to Life

This series describes in simple terms the species, ecosystems and regions that we believe to be the most urgent conservation priorities, globally. We look at key challenges and potential solutions and describe how Synchronicity Earth, along with our partners, is helping to transform robust science into effective conservation action.

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