



GB0-5 Inland Water Highlights



Convention on
Biological Diversity

Global Biodiversity Outlook 5



The Global Biodiversity Outlook (GBO) is the flagship publication of the Convention on Biological Diversity (CBD). It is a periodic report that summarizes the latest data on the status and trends of biodiversity and draws conclusions relevant to the further implementation of the Convention. The fifth edition of the Global Biodiversity Outlook (GBO-5) provides a final assessment of progress towards the Aichi Biodiversity Targets. The outlook draws on lessons learned over the past two decades to help guide the development of the post-2020 global biodiversity framework.

This document highlights the main findings of GBO-5 with respect to the biodiversity of inland waters. While nearly all of the Aichi Targets are relevant in some way to aquatic biodiversity, there are some specific elements of the Aichi Targets that are especially relevant to achieving biodiverse and sustainable inland water systems.

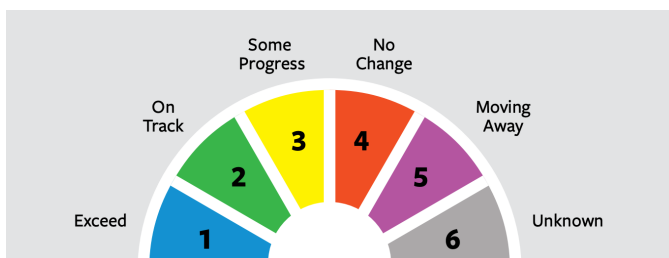
The Aichi Biodiversity Targets

In 2010, the Conference of the Parties (COP) to the CBD adopted the Strategic Plan for Biodiversity 2011-2020, which includes 20 Aichi Biodiversity Targets. These global targets were adopted with a deadline of 2020 and focus on different actions and outcomes needed to put the world on a path to achieve the 2050 Vision for Biodiversity:

By 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people



20 Aichi Biodiversity Targets were adopted by the CBD Conference of the Parties (COP) in 2010 as part of the Strategic Plan for Biodiversity 2011-2020



GBO-5 provides an assessment of progress towards the elements of all 20 Aichi Biodiversity Targets, based on available information. Progress towards each element of the Aichi Targets is depicted graphically, as shown on the left. Each segment represents an element and the colour represents the progress made.

Aichi Target 5

Habitat loss halved or reduced



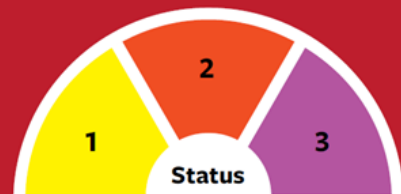
By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.

Summary of Target achievement:

Not achieved (*high confidence*). Wilderness areas and **global wetlands** continue to decline. **Fragmentation of rivers** remains a critical threat to freshwater biodiversity.

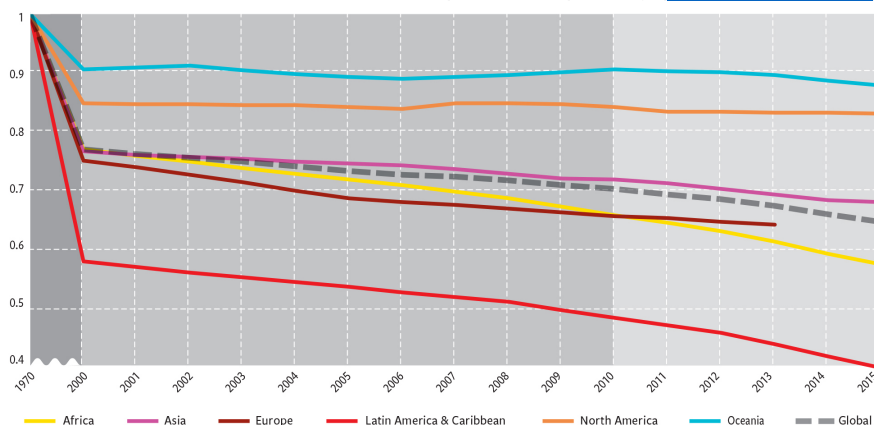
TARGET ELEMENTS

1. Forest loss at least halved
2. Loss of other habitats at least halved
3. Degradation and fragmentation reduced



- The area covered by natural wetlands has continued to decline, with the **Wetland Extent Trends (WET) index having reduced by an average of 35% worldwide** between 1970 and 2015. Latin America and the Caribbean showed the greatest loss of wetlands. During the same period, **the area covered by human-made wetlands more than doubled**. The rate of wetland loss remained fairly constant after 2011 compared with the previous period (Figure 5.4).
- **Permanent surface water was lost from an area of almost 9 million hectares** between 1984 and 2015, approximately the equivalent of Lake Superior. 70% of this loss was located in the Middle East and Central Asia, linked to drought and human actions including damming and diverting rivers, and unregulated withdrawal. Over the same period, **new permanent bodies of water covering more than 18 million hectares have formed elsewhere**, largely from reservoir filling.
- **Rivers are becoming increasingly fragmented**, further threatening freshwater biodiversity. An assessment in 2019 of the connectivity status of 12 million km of rivers globally found that only 37% of rivers longer than 1,000 km remained free-flowing over their entire length, and just 23% flowed uninterrupted to the ocean.

Figure 5.4. Wetland Extent Trends (WET) index relative to 1970 showing change from 2000-2015 in the extent of natural wetlands in six regions and globally (Darrah et al., 2019).



The indicator is indexed to a value of 1 in 1970. Note that the time series has been truncated between 1970 and 2000.

Aichi Target 6

Sustainable management of aquatic living sources



By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.

Summary of Target achievement:

Not achieved (high confidence). Inland water ecosystems are under **multiple and synergistic pressures**; their effective management is therefore integral to the conservation of freshwater biodiversity. However, **little global-level information is available** about the current state and the sustainability of inland water fisheries.

TARGET ELEMENTS

1. All stocks are managed sustainably
2. Recovery plans and measures are in place for all depleted species
3. Fisheries have no significant adverse impacts
4. The impacts of fisheries are within safe ecological limits

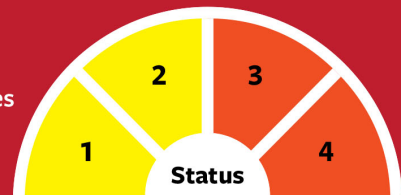
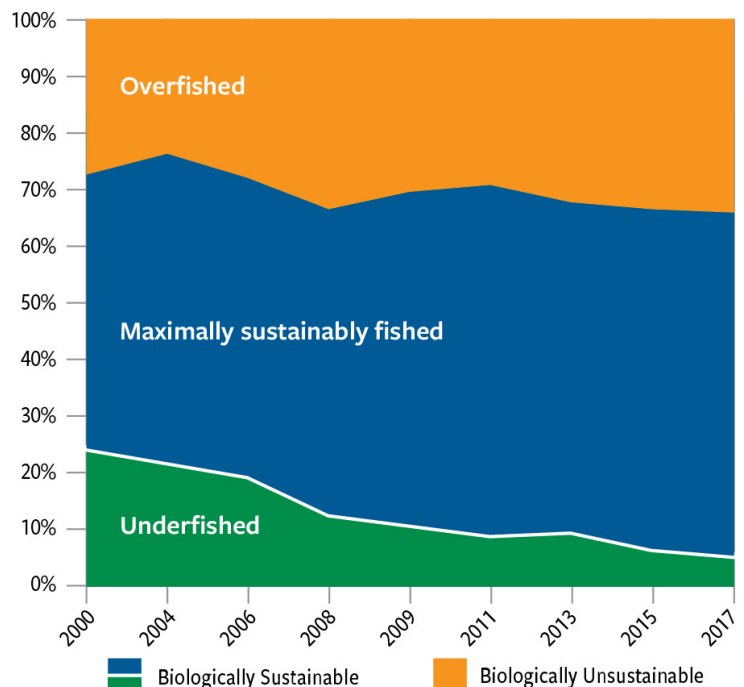


Figure 6.1. Global trends in the proportion of sustainably-fished fish stocks (FAO, 2020).

- Rivers, lakes, wetlands and other inland waters are very biodiverse, and living aquatic resources extracted from these ecosystems (inland fisheries) benefit people by **providing food for billions and livelihoods for millions of people worldwide**. Inland aquaculture produced **62.5% of the world's total farmed fish** in 2018 (51.3 million tonnes), mainly in freshwater, compared with 57.7% in 2000 (FAO, 2020).



Aichi Target 8

Pollution reduced



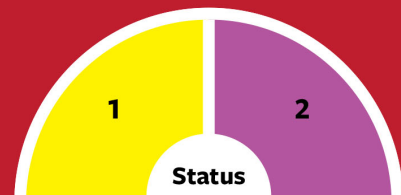
By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.

Summary of Target achievement:

Not achieved (*medium confidence*). Pollution, including from excess nutrients and pesticides, continues to be a major driver of biodiversity loss in freshwater ecosystems. Despite increasing efforts to improve the use of fertilizers, nutrient levels continue to be detrimental to ecosystem function and biodiversity.

TARGET ELEMENTS

1. Pollution is not detrimental
2. Excess nutrients are not detrimental



- Excessive levels of nutrients, in particular of reactive nitrogen and phosphorous, are considered one of the main drivers of global change, **affecting species composition in freshwater ecosystems with cascading effects on biodiversity, ecosystem function and human wellbeing**. Agricultural fertilizers are a major source of both nitrogen and phosphorous pollution.
- Plastic pollution is accumulating across freshwater ecosystems, with microplastics entering food chains and circulating in the atmosphere. Recent estimates indicate that between **1.15-2.41 million tonnes of plastic waster are carried by rivers**.

Box 8.1. Examples of national experiences and progress

Egypt: In order to effectively address pollution from all sources, Egypt has put several sectoral plans in place, and carried out specific targeted activities. National systems for **monitoring water and air pollution** have been established. **Wetlands are being created** to help manage sewage and to reduce soil pollution.

Panama: In recent decades there has been an accumulation of waste, and especially of plastic waste, in the Gunayala region. The Guna people have given themselves the task of finding simple, rapid, low cost measures to deal with it. The highest Guna political-administrative authority, the Guna General Congress, has committed to numerous actions on this issue. The most important is a project “Zero Waste: recycling routes in Guna Yala”, which aims to create **a centre for the collection and sale of recyclable material and a landfill site for the disposal of non-recyclable waste**.

Aichi Target 11

Protected areas



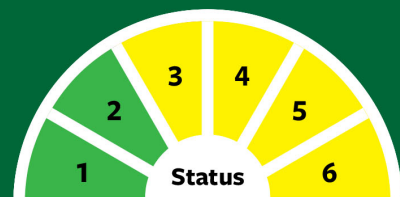
By 2020, at least 17 per cent of terrestrial and inland water areas and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascape.

Summary of Target achievement:

Partially achieved (high confidence). The proportion of the planet's land and oceans designated as protected areas is likely to reach the targets for 2020. However, progress has been more modest in ensuring that protected areas safeguard the most important areas for biodiversity, are ecologically representative, connected to one another as well as to the wider landscape and seascape and are equitably and effectively managed.

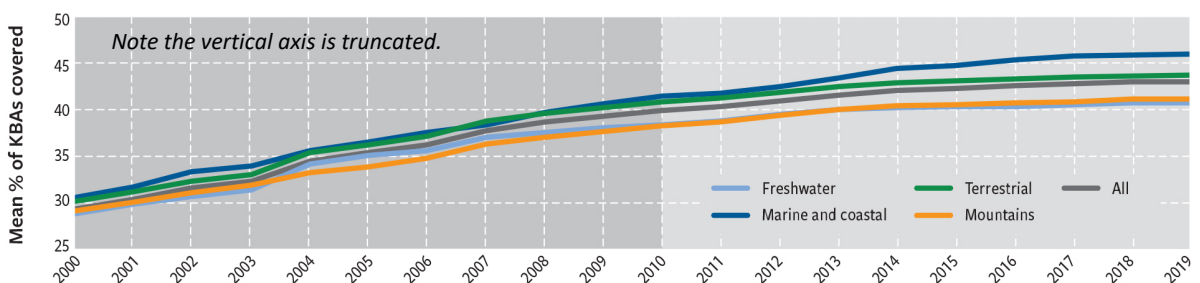
TARGET ELEMENTS

1. 17% of terrestrial and inland water areas conserved
2. 10% of coastal and marine areas conserved
3. Areas of particular importance conserved
4. Protected areas are effectively and equitably managed
5. Protected areas are ecologically representative
6. Protected areas are well connected and integrated



- By August 2020, the World Database on Protected Areas showed that about **15% of the world's terrestrial and freshwater environments were covered by protected areas.**
- For the more than 15,000 Key Biodiversity Areas (KBAs, 'sites contributing significantly to the global persistence of biodiversity'), the **global mean percentage area covered by protected areas in freshwater ecosystems increased from approximately 30% in 2000 to 40% in 2019** (Figure 11.2). Thus, a significant proportion of the most important areas for freshwater biodiversity remains without formal protection. It is estimated that **only about 27% of amphibians and birds have their overall distribution adequately represented by protected areas.**
- Maintaining or creating connections for nature between protected areas, **including through freshwater basins** – referred to as ecological connectivity – is an essential component of effective conservation. While specific targets or comprehensive indicators of connectivity are not yet available, a recent assessment indicated that a little over half of the terrestrial area under protection (7.7% of all land area) was adequately connected in 2018, an increase from 6.5% of the 'protected, connected' area in 2010.

Figure 11.2. The average proportion of Key Biodiversity Areas covered by protected areas, overall and for terrestrial, marine and coastal, freshwater and mountain ecosystems (BirdLife International and KBA Partnership, 2020).



Aichi Target 12

Reducing risk of extinction



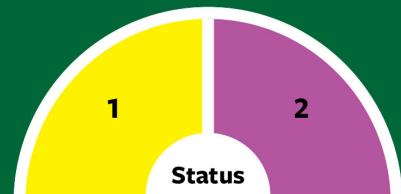
By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.

Summary of Target achievement:

Not achieved (high confidence). Species continue to move, on average, closer to extinction. However, the number of extinctions of birds and mammals would likely have been at least two to four times higher without conservation actions over the past decade. Among well-assessed taxonomic groups, nearly one quarter (23.7%) of species are threatened with extinction unless the drivers of biodiversity loss are drastically reduced, with an estimated total of one million threatened species across all groups. Vertebrate species populations have fallen, on average, by more than two-thirds since 1970, and by nearly one-third since 2010.

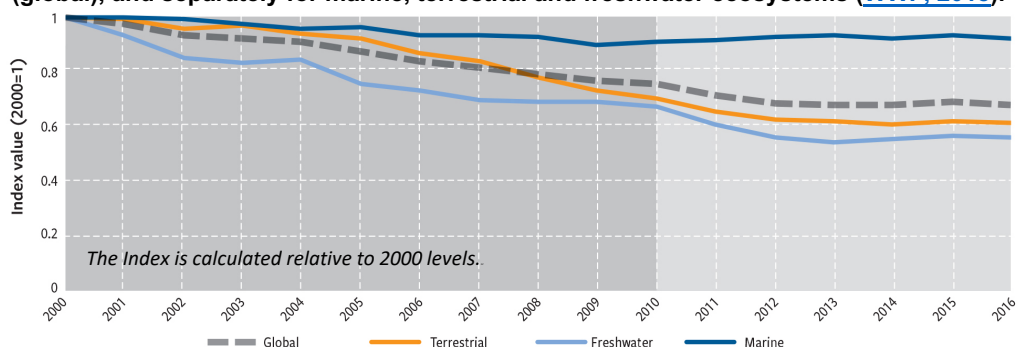
TARGET ELEMENTS

1. Extinctions prevented
2. Conservation status of threatened species improved



- According to the Red List Index, the proportion of species threatened with extinction averages 23.7% across comprehensively assessed taxonomic groups, ranging from **7.5% for selected families of bony fishes**, to **14% of birds**, 26% of mammals, 30% of sharks and rays, 36% of selected families of dicots (magnolias and cacti) **and 41% of amphibians**. In all, out of 120,372 species assessed for the IUCN Red List, a total of 32,441 species (27%) are listed as threatened with extinction. However, only about 5% of described species have been evaluated.
- The Living Planet Index (LPI), is a sensitive indicator of changes in species abundance tracking trends for almost 21,000 surveyed populations of over 4,300 vertebrate species. Overall, the index showed an average decline of 68% between 1970 and 2016, with 95% confidence that the decline was between 62% and 73%. This means that, on average (using a geometric mean), vertebrate species populations worldwide are approximately under one-third the size they were in 1970. **For freshwater species, the index is less than one-fifth of the 1970 level.** At a regional level, the LPI has declined the most, compared to 1970 levels, in Latin America and the Caribbean (94% since 1970) **driven by very negative trends in reptiles, amphibians and fish**. Looking at the more recent trend since 2000, the Living Planet Index has fallen by just under one-third overall (32%), **with freshwater species populations continuing to decline the most (44%)**, followed by terrestrial species populations (39%), and marine species populations (8%).

Figure 12.3. The Living Planet Index (LPI) showing trends for 2000-2016 for all ecosystems (global), and separately for marine, terrestrial and freshwater ecosystems (WWF, 2018).



Aichi Target 14

Ecosystem services



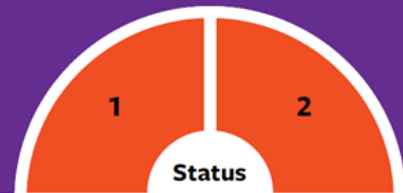
By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.

Summary of Target achievement: **Not achieved** (*medium confidence*)

The capacity of ecosystems to provide the essential services on which societies depend continues to decline, and consequently, most ecosystem services (nature's contributions to people) are in decline. In general, poor and vulnerable communities, as well as women, are disproportionately affected by this decline. Mammal and bird species responsible for pollination are on average moving closer to extinction, as are species used for food and medicine.

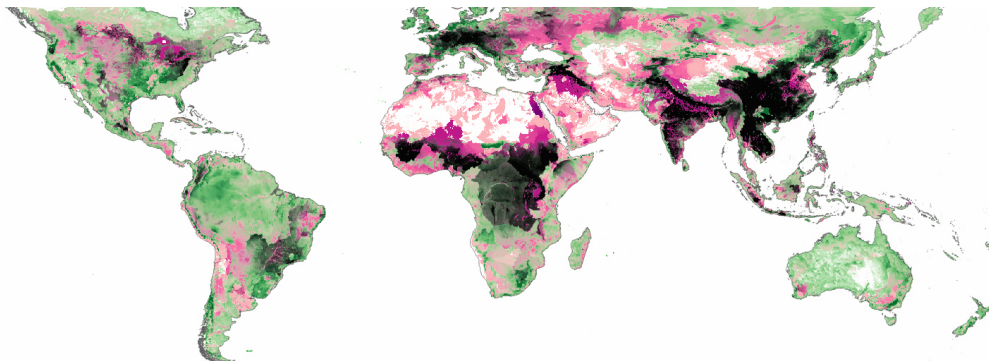
TARGET ELEMENTS

1. Ecosystems providing essential services restored and safeguarded
2. Actions take into account the needs of women, indigenous and local communities, and the poor and vulnerable



- Deforestation and land degradation have had a negative impact on freshwater quality and quantity. Approximately **half of the global population is expected to be living in water scarce areas by 2050**, especially in Asia.
- Protected areas deliver 20% of the global total of continental runoff, **providing freshwater to nearly two-thirds of the global population living downstream**. Co-management of protected areas, involving local communities, tends to be associated with delivery of greater local benefits than state management alone.
- There are numerous examples of the disproportionate impacts of a decline in ecosystem services on women and girls, although global information is limited. For example, **women are more impacted by wetland degradation than men**, due their use of wetlands for firewood, handicraft materials, water and herbal medicine. Conversely considering gender dimensions in biodiversity management can lead to positive outcomes for biodiversity and gender equality. To date, 164 countries explicitly recognize women's rights to own, use, make decisions and use land as collateral on equal terms with men. However, **only 52 countries guarantee these rights both in law and practice**

Figure 14.2. Water quality regulation, one of nature's contributions to people, mapped at a global scale (Chaplin-Kramer et al., 2019).



Water quality regulation, one of nature's contributions to people, is decomposed into 1) nature's contribution (in green), here as nitrogen retained by vegetation and avoided being exported to streams (in Kg/year), and 2) people potentially benefiting (in pink), here as the number of people downstream of each pixel of vegetation. Low values of each are translucent, meaning that green shows where nature is contributing with few people benefitting and pink is where many people would benefit but nature is not contributing. High values of both are shown in black, where nature is contributing the most to the greatest number of people.

Aichi Target 15

Ecosystem restoration and resilience



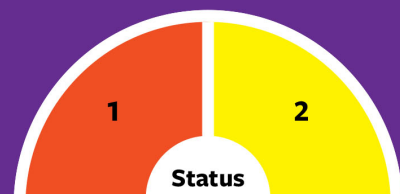
By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combatting desertification.

Summary of Target achievement:

Not achieved (*medium confidence*). Progress towards the target of restoring 15 per cent of degraded ecosystems by 2020 is limited. Nevertheless, ambitious restoration programmes are under way or proposed in many regions, with the potential to deliver significant gains in ecosystem resilience and preservation of carbon stocks.

TARGET ELEMENTS

1. Ecosystem resilience and carbon stocks enhanced
2. 15% of degraded ecosystems under restoration



- Several recent large-scale assessments demonstrate the continued and ongoing degradation of ecosystems and the impact of this on human well-being. However, they also demonstrate the range of approaches that are being taken across the world to restore ecosystems, and the range of benefits this can provide to ecosystems, climate change mitigation and adaptation, and human well-being generally. Indeed, there are numerous examples of successful approaches to restoration for most ecosystem types, including peatlands. An analysis of 400 studies documenting ecosystem recovery following large scale disturbances, found positive recovery rates in all cases, but also that ecosystems did not fully recover.
- In recent years there have been **increased efforts restore river flows** including through the removal of dams. Between 1950 and 2016, there have been **3,869 dam removals**, about a third of which have occurred in the Americas. Over the last two decades the rate of dam removal has increased exponentially and these removals are now occurring across the world. However, despite these efforts it is estimated that **there are still 6374 large dams worldwide and an additional 3377 that are planned or proposed**.

Box 15.1. Examples of national experiences and progress

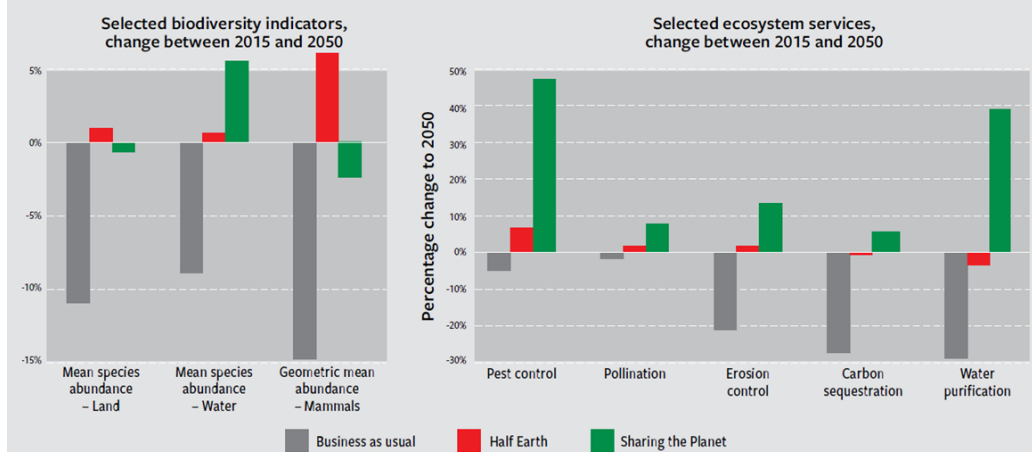
Poland: In order to increase water retention and slow runoff in mountain catchments, **more than 3 500 ponds, retention reservoirs, wetlands, and floodplains were created**. Further **waterways and wetlands were restored** as part of the project. These actions resulted in a reduction in the damage caused by flood waters, and greater protection from drought

Pathways to the 2050 Vision for Biodiversity

Despite the limited progress towards the goals and targets set for the last decade, the 2050 Vision for Biodiversity remains the benchmark guiding global action on biodiversity in the coming years. Multiple lines of evidence suggest that realizing the 2050 Vision for Biodiversity depends on a portfolio of actions in the following areas, each of which is necessary but none on its own sufficient. Each of these areas of action relies on very substantial changes and innovations, involving a wide range of actors at all scales and in all sectors of society.

- Efforts to conserve and restore biodiversity need to be scaled up at all levels using approaches that will depend on local context. These need to combine major increases in the extent and effectiveness of well-connected protected areas and other effective area-based conservation measures, large-scale restoration of degraded habitats, and **improvements in the condition of inland water bodies**, coasts and oceans;
- Efforts to keep climate change well below 2 degrees C and close to 1.5 degrees C above pre-industrial levels are needed to prevent climate impacts from overwhelming all other actions in support of biodiversity. The conservation and restoration of ecosystems can play a substantial role in this.
- Effective steps need to be taken to address all remaining pressures driving biodiversity loss, including invasive alien species, pollution and the unsustainable exploitation of biodiversity **especially in marine and inland water ecosystems**.

Figure 22.2. Outcomes in projected change to biodiversity and ecosystem services between 2015 and 2050, for ‘business as usual’, ‘Half Earth’ and ‘Sharing the Planet’ scenarios, including additional measures for climate change mitigation and sustainable consumption.¹⁸



Alternative, ambitious approaches to conservation can lead to very different outcomes both for biodiversity and for nature’s contributions to people. For example, while a focus on protecting intact ecosystems can yield the greatest gains for terrestrial biodiversity, an emphasis on improving biodiversity in ‘shared’ landscapes such as farmed land generates greater gains for services such as pest control, erosion control and pollination.

Transitions to living in harmony with nature



The Sustainable Freshwater Transition

Summary of the transition: An integrated approach guaranteeing the water flows required by nature and people, improving water quality, protecting critical habitats, controlling invasive species and safeguarding connectivity to allow the recovery of freshwater systems from mountains to coasts. This transition recognizes the importance of biodiversity in maintaining the multiple roles of freshwater ecosystems to support human societies and natural processes, including linkages with terrestrial, coastal and marine environments.

Freshwater ecosystems host a significant diversity of life. Covering less than 1% of Earth's surface, these habitats are home to approximately **one third of vertebrate species and 10% of all species** and provide **ecosystem services to billions of people**. Moreover, freshwater systems integrate terrestrial ecosystems, and their river basins or catchments, with coastal, and ultimately marine ecosystems.

The exploitation of freshwater resources for agricultural, industrial and domestic consumption has taken place with little regard to freshwater ecosystems and the services they provide. Coastal areas, wetlands and other areas near river courses, have been particularly subject to conversion or development. As a result, the current rate of wetland loss is three times that of forest loss with an estimated **30% of natural freshwater ecosystems disappearing since 1970**, and **87% of inland wetlands since 1700**. Populations of freshwater vertebrate species have declined at more than twice the rate of land or ocean vertebrates. An estimated **1.8 billion people are likely to live under conditions of regional water stress by 2050**. Many inland water and coastal ecosystems are threatened by eutrophication due to excess run-off of soil and nutrients from terrestrial areas, especially from agricultural areas and degraded ecosystems. **Safeguarding freshwater ecosystems and the services they provide for nature and humanity is therefore an urgent challenge.**

While overall progress on more sustainable policies and practices relating to freshwater ecosystems has remained low, innovative approaches in this direction have been successfully implemented in different contexts and regions across the world, demonstrating the feasibility of such actions and providing guidance on scalability and replicability.

Key components of the transition:

- Integrating environmental flows into water management policy and practice.
- Combatting pollution and improve water quality.
- Preventing overexploitation of freshwater species.
- Preventing and controlling invasive alien species in freshwater ecosystems.
- Protecting and restoring critical habitats.

