

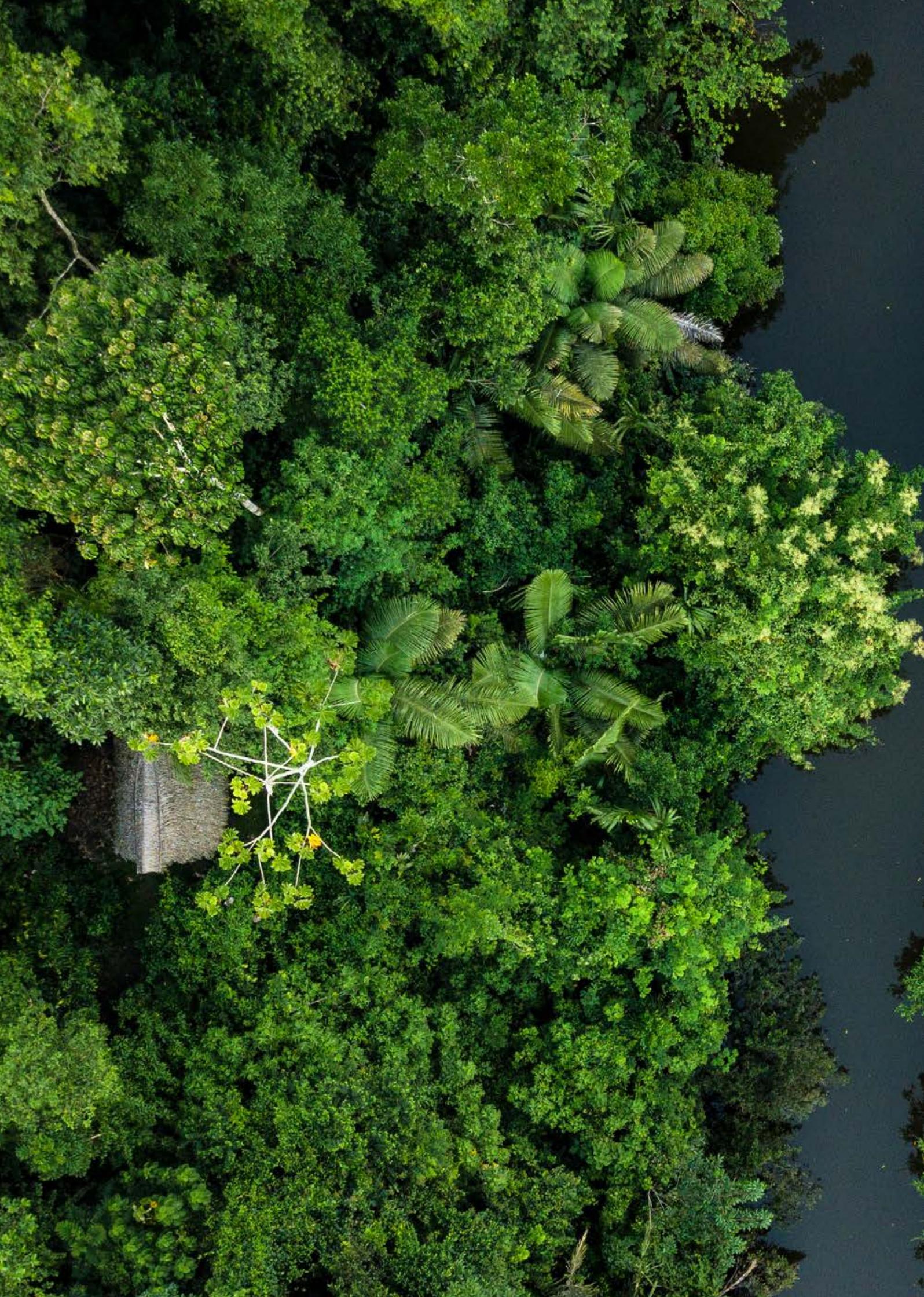


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# UNESCO's actions for biodiversity

Making peace with nature





# Contents

<b>UNESCO mandate</b>	<b>5</b>
<b>Foreword by Audrey Azoulay, Director-General of UNESCO</b>	<b>7</b>
<b>Timeline</b>	<b>8</b>
<b>Key figures</b>	<b>9</b>
<b>Protect biodiversity and ecosystems</b>	<b>10</b>
World Heritage Convention: the highest level of protection	10
Cultural Landscapes: a shared heritage shaped by humans and nature	13
Safeguarding natural sites through “no-go commitments” by the private sector	14
Supporting biodiversity in emergency situations	16
Restoring damaged ecosystems	16
<b>Restore the relationship between humans and nature</b>	<b>20</b>
UNESCO Biosphere Reserves: the gold standard for environmental sustainability	21
Environmental education: training the current generations while preparing the next	24
Promoting local and indigenous skills and knowledge	28
<b>Advancing knowledge, finding solutions</b>	<b>32</b>
Intergovernmental Science–Policy Platform on Biodiversity and Ecosystem Services	32
The science of CO <sub>2</sub> absorption: carbon sinks under pressure	34
Assessing the impact of Climate Change on UNESCO World Heritage Glaciers	35
Resilient Reefs: Shaping the future of climate adaptation	35
EDNA: A game-changing technology to map marine life	38
Leading and developing ocean biodiversity science	39
UNESCO Global Geoparks Network: linking geology and biodiversity	39
UNESCO Earth Network	41
<b>Bibliography</b>	<b>42</b>

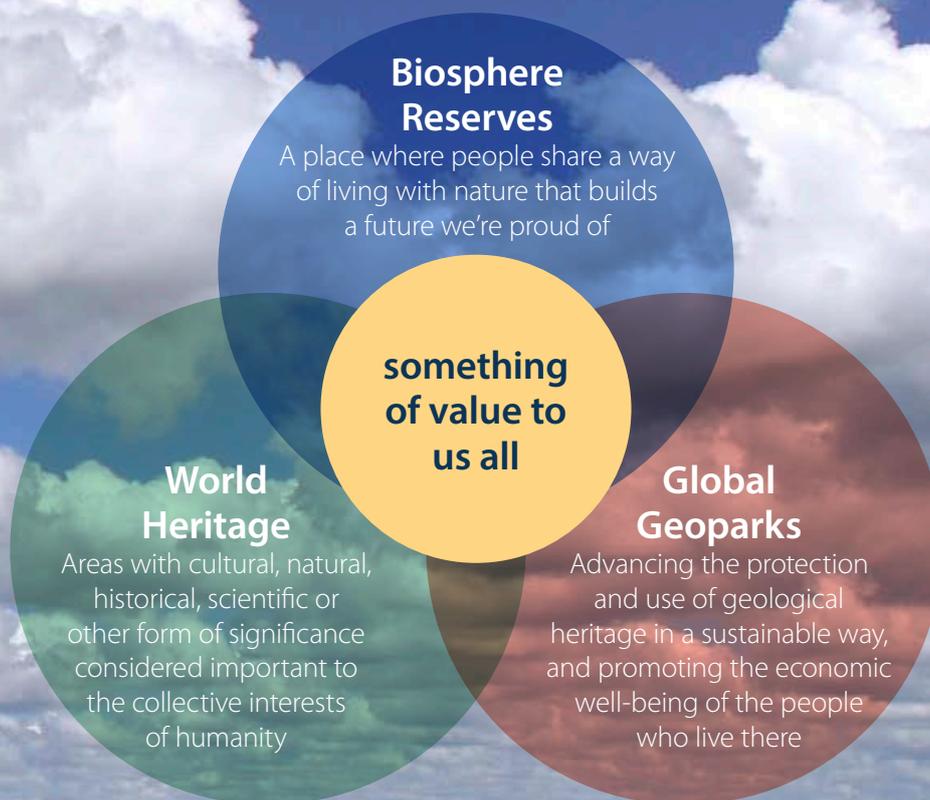


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# UNESCO mandate

As the only United Nations organization with a mandate in education, sciences and culture, UNESCO develops and coordinates global standards and programmes with an approach linking nature and culture to conserve and sustainably use biodiversity.

The Organization leads three main frameworks for the protection of natural areas, which interact and complement each other: the World Heritage, the Man and Biosphere program and the Global Geoparks Network. UNESCO also supports numerous research programs and networks to find solutions and share knowledge.





# Foreword by Audrey Azoulay, Director-General of UNESCO

Fires and unprecedented droughts in Europe and Asia, catastrophic floods in Pakistan, the intensification of tornadoes and cyclones in the Americas: we have clearly entered the Anthropocene.

This is an era marked by climate disruption, declining ocean health and, of course, an unprecedented collapse in biodiversity.



In the history of our planet, never has nature declined so quickly, according to a report released at UNESCO in April 2019 by IPBES, the equivalent of the IPCC for biodiversity. Humans have already altered three-quarters of the land-based environment and two-thirds of the marine environment. One million species, out of a total of eight million identified today, are at risk of extinction.

We have a collective responsibility to quickly change course and restore our relationship with nature. UNESCO has much to offer in this

respect, since it has addressed these issues for more than 50 years

For us, making peace with the planet depends on taking immediate action in three areas, where everyone – civil society, scientists, decision-makers, journalists, artists and creators – has a role to play.

First of all, we must develop scientific knowledge about ecosystems – because we can only protect what we know. Secondly, we must support preservation efforts, of remarkable natural sites in particular, in order to stop the collapse that is taking place before our eyes. Finally, we must educate, because we can only safeguard what we are aware of. In this field, UNESCO has an important goal: to give biodiversity a prominent place in school curricula, where it is still all too often overlooked.

In other words, we must bring about a radical change in mindset. We must develop a form of ecology based on reconciliation, a new form of environmental ethics where humans learn to preserve biodiversity by living with it, rather than isolating it.

To bring about this reconciliation, UNESCO has an incredible reservoir of experience, with 257 natural World Heritage sites, 738 Biosphere Reserves and 177 Global Geoparks. This reservoir deserves to be better known, because it contains many models to discover and duplicate.

Our task is a daunting one and we no longer have the luxury of time. It is now urgent for the safeguarding of biodiversity, like the fight against climate change, to become one of the major priorities of our time.

# Timeline

**1960**

**Creation of the Intergovernmental Oceanographic Commission (IOC) of UNESCO**

Established to coordinate global marine scientific research programmes and ocean and coastal services, such as tsunami warning systems.

**1964**

**Creation of the International Biological Programme**

The 5-year research programme was dedicated to the study of ecosystem dynamics.

**1971**

**Creation of the UNESCO MAB programme**

**1972**

**Adoption of the UNESCO World Heritage Convention**

The Convention brings together the preservation of cultural sites, and the conservation of nature.

**1976**

**First UNESCO biosphere reserves**

The first 57 biosphere reserves designated were located in former Zaire, Iran, Norway, Poland, Thailand, the United Kingdom, the United States of America, Uruguay and former Yugoslavia.

**1992**

**First transboundary UNESCO Biosphere Reserves**

Two transboundary biosphere reserves were nominated: Krkonoše / Karkonosze between the Czech Republic and Poland; and Tatra between Poland and Slovakia.

**2004**

**Launch of the UNESCO Global Geopark Network**

Birth of the Global Network of National Geoparks (17 European and 8 Chinese) during the First International Conference on Geoparks held in Beijing, China.

**2012**

**Co-creation of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)**

Established in Panama City by UNESCO, UNEP, FAO, UNDP and 94 governments.

**2019**

**IPBES global biodiversity report**

Adopted at UNESCO Headquarters (Paris), the report highlights unprecedented dangerous decline and acceleration of species extinction rate, with estimated 1 000 000 species threatened by extinction.

**2021**

**UN Decade on Ecosystem Restoration and Ocean Science for Sustainable Development**

Led by UNESCO, as the UN agency in charge of the Ocean.

**2021**

**UN Decade on Ecosystem Restoration**  
In partnership with UNESCO.

**2022**

**COP15 of the Convention for Biological Diversity**

Expected adoption of the post-2020 Global Biodiversity Framework.

**2025**

**5th World Congress of UNESCO Biosphere Reserves**

**2030**

**End of the 2030 UN Agenda for Sustainable Development**

# Key figures

## The scientific evidence

**8.1** million species; 1 million face extinction, many within decades

**75%** of the global land surface has been significantly altered

**32 million** hectares of tropical forest were lost between 2010 and 2015

Over **85%** of wetlands have been lost since 1700

**50%** of live coral on reefs have been lost in the past 150 years

Only **1/5** of school curricula mentions biodiversity

## UNESCO actions

Natural World Heritage sites account for **8%** of all protected areas on earth (1% of Earth's surface)

**738** UNESCO Biosphere Reserves in **134** countries, conserving more than 1,3 million km<sup>2</sup>

**218** Natural World Heritage sites and **39** Cultural and Natural World Heritage sites, extending across more than 3,5 million km<sup>2</sup>

**177** UNESCO Global Geoparks

**3%** of the world's entire mangrove surface is found in Sundarbans, a UNESCO designated site located in Bangladesh and India

**141,885** ha, the size of Europe's last remaining primary forest, Bialowieza, a UNESCO designated site located in Belarus and Poland

**12** Great Ape species found in UNESCO biosphere reserves and World Heritage sites in Sub-Saharan Africa and South-East Asia

**7** specimens of porpoise remaining in the world, all of which in a UNESCO biosphere reserve in Mexico. It is the world's most critically endangered marine mammal species

**40** UNESCO Chairs related to biodiversity

# Protect biodiversity and ecosystems

The international community aims to create protected areas on at least 30% of the planet by 2030. This objective is meaningless if humans continue to destroy in the remaining 70%. The conservation and protection of biodiversity calls for a deeper change in values and behavior, training and educating 100% of humans to live in harmony with other species in the living world, everywhere on earth, for present and future generations.

UNESCO makes an important contribution to this objective, through its comprehensive set of legal instruments, networks and initiatives, including the World heritage convention, the Biosphere Reserves network, the Global Geoparks network, and a variety of educational and scientific programmes to protect biodiversity and ecosystems.

At the heart of UNESCO's vision is bringing together all stakeholders across its programmes and sites. This is

achieved by co-designing management plans and policies that include local and indigenous people, government entities, national agencies, intergovernmental organizations, NGOs, researchers, as well as the private sector. This method of governance is the key to effective conservation of biodiversity and ecosystems.

## World Heritage Convention: the highest level of protection

The Convention concerning the Protection of the World Cultural and Natural Heritage was adopted in 1972. It has been ratified by 194 States around the world. This Convention encourages the identification, protection, and preservation of natural heritage around the world considered to be of outstanding universal value to humanity. It is also unique in its recognition of the close linkages between cultural and biological diversity.

### Spotlight: Protecting mangroves and enabling tiger/human cohabitation in the Sundarbans Biosphere Reserve, India

Sundarbans is the largest delta and mangrove forest in the world, with an exceptional range of flora and fauna and the highest number of mangrove biodiversity globally. It is also the only mangrove tiger-land on the planet and is a highly productive ecosystem that acts as a natural fish nursery.

Some three million people live in the biosphere reserve (2001). They depend directly on forest and forest-based resources since agriculture is not productive enough due to the

saline water. Sales of timber, fuel wood, thatching leaves, honey and wax are the main sources of income. Due to demographic pressures, the Sunderban is under great stress and therefore an eco-development programme was launched based on a highly participative approach of the local communities.

One of the key objectives was to control and mitigate human/tiger conflict: nylon net fences have been erected along the forest-village border and quick response

teams are stationed at strategic locations to manage tiger incidents. Regular interactions with fringe villages and information sharing sessions have drastically improved mass awareness in Sundarban. Emphasis is given to schemes that generate additional income and economic security to people, such as mangrove forest management, animal husbandry, popularisation of energy alternatives, habitat improvement, aquaculture, honey and wax culture, development of crafts and education.

There are currently 1,154 World Heritage sites in the world. Among them, 218 natural sites and 39 mixed sites inscribed both for their cultural and their natural properties: they represent a total of 3,5 million km<sup>2</sup> (of which 60% is marine), an area roughly equivalent to the size of India.

These World Heritage natural sites provide crucial habitats to many iconic species and harbor unique natural beauty, stunning landscapes, rare ecological processes, and exceptional biodiversity. These are powerful instruments for concrete action in preserving threatened sites and endangered species in terrestrial and marine environments.

### ***A robust legal and monitoring instrument***

Of all the international conventions focusing on biodiversity conservation, the World Heritage Convention is the one with the highest standards for inscription in terms of the biodiversity requirements of sites. In a report published in 2016, the World Wildlife Fund considered the World Heritage Convention to be the “highest level of recognition, oversight and protection” for a natural site.

UNESCO designated World Heritage sites are protected under international law as humanity’s legacy to future

generations. Under the Convention, all the States Parties undertake to assist in the protection of the sites. They are furthermore obliged to refrain from taking any deliberate measures which might directly or indirectly damage them.

The characteristics of each site are detailed at the time of registration. The State Party is then required to ensure their integrity. Any development project on site must be the subject of an impact study, in particular environmental, which is sent to the World Heritage Center for examination.

The States Parties are also required to transmit to UNESCO a report on the state of conservation of each World Heritage site in danger every year. This tool contributes to verifying that the protective measures are properly applied and sufficient. The UNESCO Centre’s experts verify the accuracy of the data and can organize a field mission for additional checks.

In addition to the direct protection of the sites, the Convention gives the possibility to States Parties of establishing a “buffer zone” around the site, also subject to specific legal rules of installation and organization.





## Spotlight: The mountain gorilla population is now growing again

UNESCO protects a large part of the Virunga massif, in DRC, Rwanda and Uganda, under the World Heritage Convention and the Biosphere Reserve programme. It is in this area that some of the last specimens of the mountain gorilla live. This species was threatened with extinction by poaching, disease and deforestation. Thanks to conservation measures involving local communities, the situation is improving. The number of mountain gorillas has increased from 480 in 2010 to 604 in 2022. In total, there are an estimated 1,004 individuals in the Great Lakes region of Africa living in the wild. It is the only great ape whose population is growing.

## Cultural Landscapes: a shared heritage shaped by humans and nature

To reveal and sustain the great diversity of interactions between humans and their environment, to protect living traditional cultures and preserve the traces of those that have disappeared, UNESCO has developed the concept of Cultural Landscapes, which were recognized in 1992 as a specific category of sites eligible for the World Heritage List.

Cultural Landscapes – which can include cultivated terraces on lofty mountains, gardens, or holy sites – testify to the creative genius, social development, and the imaginative and spiritual vitality of humanity. They are part of our collective identity. To date, 121 properties – including 6 that overlap several countries – have been included as Cultural Landscapes on the World Heritage List.

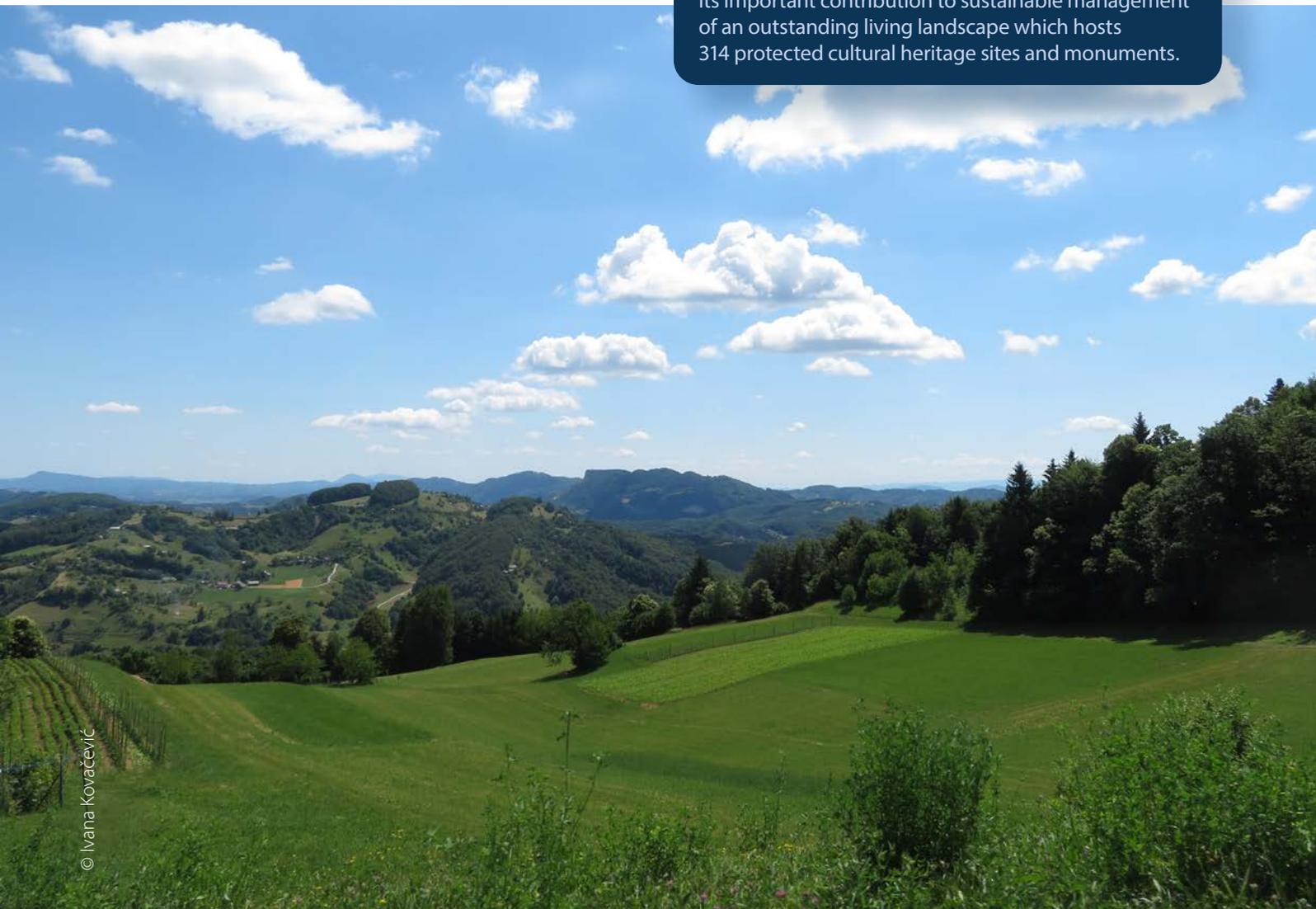
### *A testament to the diversity of land use*

There are a great variety of Cultural Landscapes that are representative of the different regions of the world. Combined works of nature and humankind, they express a long and intimate relationship between peoples and their natural environment.

Certain sites reflect specific techniques of land use that guarantee and sustain biological diversity like the Konso Cultural Landscape (Ethiopia). Others, associated in the minds of the communities with powerful beliefs and artistic or traditional customs, embody an exceptional spiritual relationship between people and nature, like the Royal Hill of Ambohimanga (Madagascar) or the Cultural Landscape the Subak System, a Manifestation of the Tri Hita Karana Philosophy, in Bali (Indonesia).

### **Spotlight: UNESCO-Greece Melina Mercouri International Prize for the Safeguarding and Management of Cultural Landscapes**

The UNESCO-Greece Melina Mercouri International Prize for the Safeguarding and Management of Cultural Landscapes was created in 1995 to reward outstanding efforts in the protection and management of cultural landscapes. The Prize, generously supported by the Greek Government, bears the name of Melina Mercouri, former Minister of Culture of Greece and a strong advocate of integrated conservation. The US \$30,000 Prize is awarded every two years to one laureate. The Public Institute of Kozjansko Park in Podsreda, Slovenia, was awarded the 2021 edition, for its important contribution to sustainable management of an outstanding living landscape which hosts 314 protected cultural heritage sites and monuments.



## Safeguarding natural sites through “no-go commitments” by the private sector

The economy depends on, and impacts, biodiversity. UNESCO has therefore asked business leaders to commit to protecting World Heritage sites.

To date, more than 50 international companies from the extractive, finance, insurance and hydropower industries, as well as industry associations have promised to respect these sites as no-go zones for harmful development projects.

UNESCO has also developed guidance to assist companies to adopt a comprehensive World Heritage policy as part of their efforts to measure and manage Environmental, Social and Governance (ESG) risks.

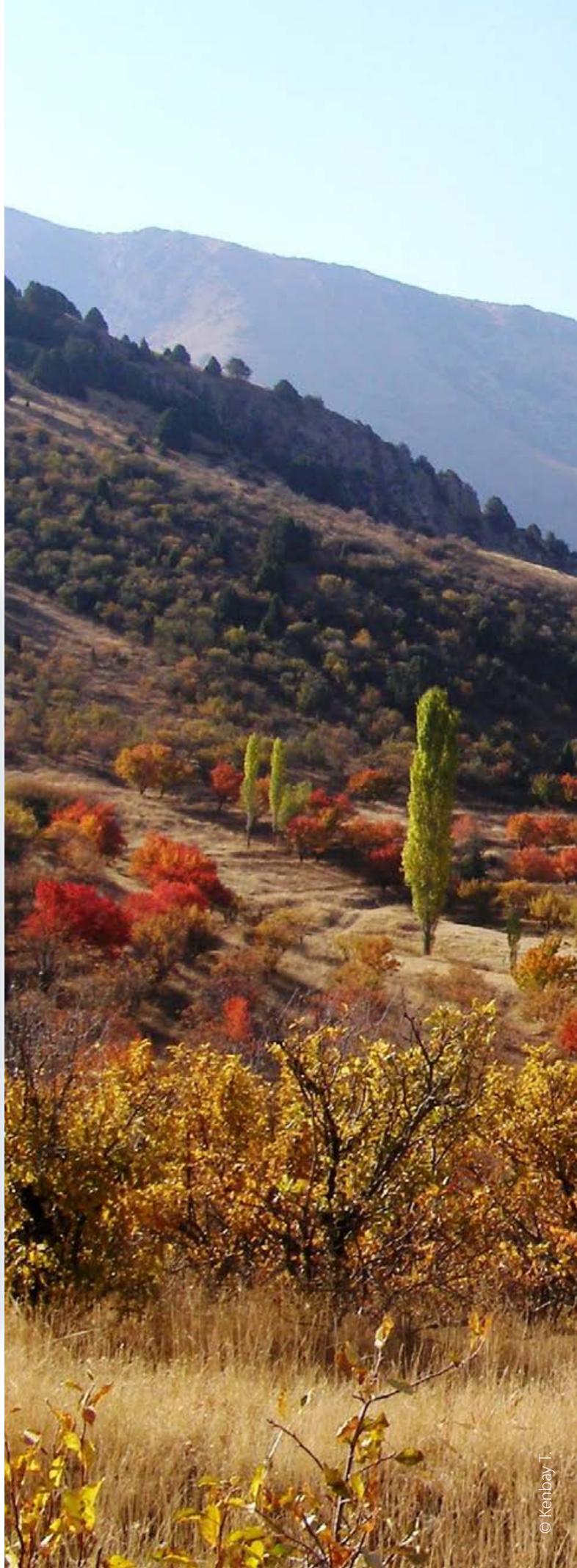
### Spotlight: Mountain ecosystems, hotspots of cultural and biological diversity

Mountains feature prominently on the World Heritage list, including several of planet’s most iconic peaks like Mount Kilimanjaro (Tanzania) and Mount Everest (Nepal).

Mountain sites often play a direct role in providing food, clean water and medicinal plants. Western Tien-Shan, a transnational World Heritage property across Kazakhstan, Kyrgyzstan and Uzbekistan, is known for its rich agrobiodiversity including nut and fruit trees and many rare cultivated plants. In this way, conserving the property also contributes to enhancing food security in the region.

Some mountains are also inscribed on the World Heritage List for cultural values, such as Tongariro National Park (New Zealand) where the mountains at the heart of the park have cultural and religious significance to the Maori people for whom they symbolise the spiritual links between this community and their environment.

The Risco Caído and the Sacred Mountains of Gran Canaria Cultural Landscape (Spain) are where pre-Hispanic culture has survived while shaping the landscape, and conserving traditional practices such as transhumance, terrace-farming, and water management installations.





## Supporting biodiversity in emergency situations

In the event of emergencies such as forest fires, sudden increase in poaching, armed conflicts, or oil spills, precious time is often lost in organizing an intervention, while during this time, biodiversity can be severely damaged.

This spurred UNESCO to launch the Rapid Response Facility (RRF) to channel emergency grants to UNESCO-designated sites and other internationally recognized areas. Funding decisions are made within 8 working days, making RRF the world's fastest conservation funding mechanism.

Since its launch in 2006, the RRF has provided over 1.2 million US\$ of emergency support to more than 25 UNESCO-designated sites, contributing to the protection of over 30 million hectares.

Several World Heritage sites and biosphere reserves such as Pantanal Conservation Area (Brazil), Islands and Protected Areas of the Gulf of California (Mexico) and W-Arly-Pendjari Complex (Benin, Burkina Faso, Niger) are among the recent grantees.

UNESCO also manages the World Heritage Emergency Fund, which helps finance the rehabilitation of inscribed sites that have been damaged. Nearly 12 million US\$ has been provided to the State parties through this fund since it was established in 2015.

## Restoring damaged ecosystems

Ecological restorations are intentional activities that initiate or accelerate the recovery of ecosystems from a degraded state. Through its programmes and designated sites, UNESCO contributes to raise the number of degraded ecosystems under restoration.

UNESCO network of sites also enhance the sharing of sustainable practices in the management of ecosystems, landscapes and people. UNESCO biosphere reserves provide frames and tools to guide site managers and communities on both conservation and development goals, connecting conservation areas and areas allowing sustainable development.



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### Spotlight: Sharing Bedouin experience of resource conservation in Egypt's Wadi Allaqui Biosphere Reserve

The Wadi Allaqui UNESCO Biosphere Reserve is located in Egypt's south-eastern desert, about 180 km south of Aswan on the eastern side of Lake Nasser. It is a major dry river, which drains from the Red Sea hills to the Nile Valley. It was recognised as a Biosphere Reserve in 1993.

The roughly 1,000 non-sedentary inhabitants use the Biosphere Reserve's natural resources for their livelihood, including livestock

transhumance, charcoal production, the collection of medicinal plants, quarrying and small-scale cultivation. Resource conservation has been a concept inherent in the Bedouin's livelihood and value system over centuries. The views, aspirations and accumulated knowledge of the Bedouins are documented and included in decision-making processes within the biosphere reserve.

Research and training activities cover a wide range of issues related to arid zone ecology and resource use. Recent research projects also include work on fuel wood energy and conservation, indigenous medicinal plants, the cultivation of Egyptian balsam for oil production, the natural history of the Wadi Allaqi, and water use and salt recycling of *Tamarix* sp, a genus of trees capable of concentrating salt on their leaves.



© UNESCO/Maria Rosa Cardenas

### **Spotlight: 290,000 trees planted in La Selle Biosphere Reserve, Haiti**

Haiti has one of the highest rates of deforestation in the world. In 1960, forest covered around 60% of the territory, but this has fallen dramatically to 13.6% in 2000, then 3.5% in 2011. This situation has caused serious erosion problems. UNESCO is implementing a project to address deforestation and soil loss in the La Selle Biosphere Reserve, with the support of Spain.

The project has engaged communities in the creation of 4 tree nurseries and continuous reforestation of areas in exchange for financial support and free education for local children. It has also supported the promotion of coffee production, generating jobs for the population.





### **Spotlight: El Hierro, the world's first self-sufficient island powered by renewable energy**

El Hierro is a volcanic island in the Canary archipelago of Spain, designated as a UNESCO biosphere reserve in 2000. Over 11,000 people live on the island with agriculture and tourism as their main livelihood. In 2014, a hybrid hydro-wind power system made El Hierro the first island to be self-sufficient in energy using only renewable energy sources. The Biosphere Reserve is also committed to clean transport, with 7 free charging points for electric vehicles.

# Restore the relationship between humans and nature

The protection of biodiversity calls for a deeper change in values and behavior, reconciling 100% of the world's citizens with other species in the living world, everywhere on earth, for present and future generations. This calls for new ways to coexist with the nature, designing more sustainable uses of biodiversity and new models of production and consumption.

UNESCO designated sites are rich in examples of such best practices associated to worldviews where humans do not dominate or exploit nature. This presents a wealth of innovative solutions and wisdom to reconcile all humans with each other and with the rest of nature, towards a new vision of cohabitation on Earth.

## Spotlight: A transboundary project to save the Lake Chad Basin

The Lake Chad Basin is an exceptional reservoir of biodiversity and a source of life for more than 40 million people. However, in recent decades, it has faced a security, ecological and humanitarian crisis. To respond to these challenges, in 2017 UNESCO launched the Lake Chad Biosphere and Heritage Project (BIOPALT), which combines the preservation of biodiversity and the promotion of peace.

2,000 women, youth and indigenous peoples have already been trained in the sustainable management of the natural and cultural resources. The project also includes restoring degraded ecosystems and promoting green economy jobs (such as spirulina farming), for the benefit of 30,000 people among the most fragile populations.

The project supports Cameroon, Chad and Nigeria in the creation of three new biosphere reserves and strengthens transboundary cooperation through the joint nomination by these three countries of the "Lake Chad Cultural Landscape" to the World Heritage List. The nomination will soon be examined by the World Heritage Committee.





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## Spotlight: Women for Bees Guerlain & UNESCO

Women for Bees is a state-of-the-art female beekeeping entrepreneurship programme launched by UNESCO and Guerlain. Implemented in UNESCO designated Biosphere Reserves around the world, the programme promotes women's empowerment together with biodiversity conservation and sustainable use.

The Xishuangbanna UNESCO Biosphere Reserve contains the largest rainforest in China and is one of the country's most biodiverse areas. It is also considered the richest area in terms of ethnic diversity, home to many indigenous peoples including the Dai, Ahka, Lahu, Jinuo, Yi, Yao, and Bulan.

These ancient communities are the custodians of religions, cultures and languages. For example, local people use unique log hives, made of dead or fallen trees that are hollowed then sealed with cow dung to protect the bees during winter.

Through its programme, UNESCO supports the training and networking of a new generation of women beekeepers, so that this practice continues to be transmitted.

## UNESCO Biosphere Reserves: the gold standard for environmental sustainability

In 1971, UNESCO launched the Man and the Biosphere (MAB) program with the conviction that the conservation of natural resources should go hand in hand with their rational use, and that it was not enough to simply put nature in a "closed jar" in strictly protected areas.

This vision is reflected on the ground by the creation of UNESCO Biosphere Reserves. These are terrestrial, marine and coastal territories where the inhabitants share a common project to thrive in harmonious interaction with the nature over the long term.

The MAB program combines the natural and social sciences with a view to improving human livelihoods and safeguarding natural and managed ecosystems, thus promoting innovative approaches to economic development that are socially and culturally appropriate and environmentally sustainable.

Currently, there are 738 UNESCO biosphere reserves in 134 countries, including 22 transboundary sites. They are home to more than 250 million people.



## Spotlight: In Ethiopia, the last forest of wild arabica coffee trees

The Yayu Coffee Forest Biosphere Reserve in Ethiopia is part of the Eastern Afromontane biodiversity hotspot and hosts one of the last remaining forests with wild arabica coffee trees in the world. Over 150,000 people live in this territory and mainly rely on agriculture.

UNESCO has initiated over 15 different projects including the development of sustainable systems for forest and coffee management, cooperative unions in coffee growing areas, training of producers in improving coffee quality through processing and storage, and linking producers with direct buyers.

The biosphere reserve has also conducted research on crop diversification and contributed to the restoration of degraded forest areas through tree-planting and contributing to sustainable agricultural practices.

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### *Learning places for sustainable development*

Biosphere reserves are 'learning places for sustainable development'. They are sites to develop new interdisciplinary approaches to understand and manage change, as well as the interactions between social and ecological systems. This includes conflict prevention and management of biodiversity. They are places that provide local solutions to global challenges.

Each site promotes solutions reconciling the conservation of biodiversity with the sustainable use of resources, providing local solutions to global challenges.

Biosphere Reserves are designated under the intergovernmental MAB Programme by the Director-General of UNESCO following the decisions of the MAB International Coordinating Council (MAB ICC). Like World Heritage sites, they remain under the sovereign jurisdiction of the states where they are located and their status is internationally recognized.

### *Developing research and knowledge sharing*

To strengthen the networking of biosphere reserves, UNESCO created a dedicated research center in 2013, thanks to the support of the Abertis Foundation. It is located near Barcelona, Spain. The International Center for the Mediterranean Biosphere Reserves (UNESCOMED) is the first center combining public commitment with the support of private funding. Its pioneering nature can serve as an example for scientific cooperation between the two shores of the Mediterranean Sea and constitutes a platform for the exchange of information on aspects related to Biosphere Reserves and their sustainable development. For this purpose, the Mediterranean Biosphere Reserves Network (MedMaB) has been created.



## Environmental education: training the current generations while preparing the next

The Director-General of UNESCO, Audrey Azoulay, has set the goal that all 193 Member States of the Organization integrate environmental education into school curricula by 2025. Environmental education aims to ensure that each learner acquires the knowledge, skills and mindset to act for our planet.

To achieve this ambitious project, UNESCO launched in February 2022 a common repository of educational content for policymakers and curriculum developers. It provides the keys needed to integrate nature education at every level of the educational chain: from the drafting of national curricula to the preparation of lessons by teachers.

UNESCO also initiated activities in the area of teacher training and the development of learning materials in the context of biosphere reserves, World Heritage sites and UNESCO Global Geoparks, with the involvement of the UNESCO Associated Schools Network (ASPnet) and UNESCO Chairs.

### *Putting youth at the heart of ecosystem management*

UNESCO is committed to involving youth more directly within its programming, such as through youth networks. MAB Youth Forums have been regularly organized since 2017. The MAB program also regularly supports the participation of young people from the Global Youth Biodiversity Network (GYBN) to the Convention on Biological Diversity meetings.



© Nevena Kereša/Dragodid, 2015

The World Heritage Volunteer Initiative is another example, encouraging young people to undertake concrete actions and play an active role in the protection, preservation and promotion of World Heritage. Since its creation, in 2008, more than 5,000 volunteers took part in the programme, more than 350 action camps have been held in about 60 countries and in partnership with over 100 youth organizations and NGOs.

UNESCO also launched the Green Citizens campaign in 2015, which invites people to support change through key environmental action levers: Biodiversity, Oceans, Hydrology, Education for Sustainable Development and Indigenous and Local Knowledge. An online platform promotes a selection of change agents and local innovative projects with a big impact and solutions that can be easily replicated.

### Spotlight: Kusi Kawsay, an exemplary rural school in the Peruvian Andes

Founded in 2008 by a small group of parents, Kusi Kawsay School is an alternative school located in Pisac (Peru) that offers a unique educational program that combines a rich set of ancestral Andean knowledge, philosophy, and traditions with Waldorf education pedagogy.

Following the Andean ancestral calendar, youth and adults learn to practice *buen vivir* ("living well"), where both the land and the community are cared for. Using music, dance, weaving, art, and gatherings, the program develops learning activities that combine education with ancestral heritage and agriculture, and practices experiential learning with hands-on activities to reflect and act on global challenges.

Kusi Kawsay is part of the network of UNESCO partner schools and in 2021 received the UNESCO and Japan Prize for Education for Sustainable Development. An endowment of US \$50,000 dollars was allocated to the school to continue the development of their activities.







## Spotlight: Juzur Farasan Biosphere Reserve in Saudi Arabia: an example of local irrigation techniques in the South Red Sea

The archipelago of Juzur Farasan is a group of islands located at the extreme south-west of Saudi Arabia. The 820,000ha area combines marine and terrestrial habitats forming a network of important ecosystems in the South Red Sea. The Farasan Islands feature rare and endemic species of both flora and fauna that contribute to making this first biosphere reserve in Saudi Arabia, an exceptional site. It is home to three of Saudi Arabia's 13 recorded stands of the threatened red mangrove *Rhizophora mucronate*, as well as a

population of *Dugong dugon* listed as a vulnerable species on the IUCN Red List, the largest population of Idmi gazelle in the country and various species of seabirds (nesting pink-backed pelican, osprey, crab-plover), marine species (several dolphin species, whales, hawksbill sea turtles, corals and manta rays) and reptiles. The remoteness of the islands has contributed to the preservation of many local agricultural traditions. Local people still maintain built terraces and employ traditional irrigation systems, using traditional

forms of small-scale, subsistence agriculture in areas where shallow wells are maintained and used to irrigate local plants varieties including cereals and vegetables. The recent inscription of the first 2 UNESCO biosphere reserves in Saudi Arabia in 2021 and 2022 bears witness to a stronger recognition of such ecosystems management techniques in the region and could help accelerate knowledge sharing, notably for the restoration of mangroves.

## Promoting local and indigenous skills and knowledge

Environmental education is not only based on the transmission of scientific knowledge and awareness of contemporary issues. UNESCO is convinced that part of the solutions to today's environmental challenges exist in the traditions, skills and local knowledge, in particular those of indigenous peoples, to be shared at a wider scale.

The transmission of this knowledge is one of the objectives of the 2003 UNESCO Convention on the Intangible Cultural Heritage of Humanity, ratified by 180 States. It is the only binding multilateral instrument in this field.

The Convention safeguards oral traditions and expressions, performing arts, social practices, rituals and festive events, knowledge and practices concerning nature and the universe, and traditional craftsmanship all over the world.

The list currently has 641 items, in 140 countries, of which 228 are related to the protection of biodiversity. These include for example sustainable fishing and hunting practices but also rituals that recall the special connection between humanity and the environment.

### Spotlight: In Nicaragua, Bringing indigenous knowledge into the classroom

UNESCO's Local and indigenous Knowledge Systems (LINKS) programme has worked with the Mayangna indigenous people in the Bosawas Biosphere Reserve (Nicaragua) to document their knowledge, specifically of turtles and fish, and to develop educational materials that can be used in schools.

The action is providing materials that bring indigenous Mayangna knowledge into the classroom, encouraging both students and teachers to engage more widely with the knowledge of their elders and other community members. The project aims to improve respect for Mayangna knowledge among non-Mayangna children and the public. Materials developed include books in Mayangna and Spanish, teacher's manuals and posters.

### Spotlight: Preserving to develop, developing to preserve in Dong Nai Biosphere Reserve, Vietnam

The Dong Nai Biosphere Reserve in the South-East of Vietnam is a model for sustainable and harmonious development between human beings and nature. Its nearly 1 million hectares of land compose a seamless mosaic of tropical forests and wetland areas, steep hills and large lowlands.

This diverse landscape has fostered a high level of biodiversity, with over 8000 unique plant and wild animal species. These include endangered species such as white-shouldered ibis, Indochinese tiger, Asian elephant and the critically endangered Javan Rhinoceros, one of the world's rarest large mammals.

Since over 90% of the local population depend on agriculture as their main source of livelihood, preserving this naturally abundant environment is a vital priority and a cornerstone of UNESCO action in the region, notably through the establishment of a network of pesticide-free vegetable farms run by local Green Clubs, sustainable fisheries on the Tri An Lake, and the Hieu Liem Deer Farm Village.

The area has also been able to retain much of its original diversity due to the survival of areas of unmodified habitat and the suppression of hunting and other forms of disturbance. The Dong Nai Biosphere Reserve is also a rich cross-cultural space containing several historical relics and acting as a melting pot for the 11 ethnic groups who live there.





A photograph of a waterfall in a dense tropical forest. The water is white and frothy as it falls over large, dark rocks. The surrounding vegetation is thick and green, with many leaves visible in the foreground and background. The scene is captured from a slightly elevated angle, looking down at the waterfall.

## Spotlight: In Colombia, a World Heritage site in danger saved thanks to the involvement of the population

In Katios National Park (Colombia), inscribed in 2009 on the List of World Heritage in Danger, the management of this site has achieved major progress in implementing a special management regime with indigenous communities, such as the Wounaan community of Juin Phubuur and Afro-Colombian communities, in the management of the property.

These exemplary partnerships have fostered sustainable use of natural resources and improved ecological connectivity in the territory. They have contributed to remove the property from the List of World Heritage in Danger in 2015.

In the last decision by the World Heritage Committee (2019) concerning the state of conservation of the property, the State Party was commended for these achievements and invited to share these learning experiences as good practices.

## Involving indigenous and local populations in the governance of protected areas

The success of biodiversity conservation projects is based on an essential element: that these projects are carried out with and for the benefit of local populations. They are the ones who know the territory best, because they have often learned over centuries to live there in a balanced relationship with nature.

UNESCO promotes among its Member States the active participation of indigenous peoples in the governance and management of protected areas. This inclusion of populations has been in the DNA of the Man and the Biosphere program since its origin.

The nomination and review processes for biosphere reserves have safeguards for indigenous peoples' participation and rights, including questions relating to full and effective participation of indigenous peoples and local communities; free, prior informed consent; good practice related to support for and transmission of indigenous and local knowledge; and social and cultural impact assessments.

In the last two decades, this subject has also come to the fore for natural and cultural World Heritage sites. The World Heritage Center has carried out substantial changes to see conservation as a social, economic and environmental process. In association with the States Parties to the Convention, it has improved its procedures and practices, with regards to the visibility of indigenous peoples, their engagement in professional area-based conservation, and attention to their rights, knowledge, languages, and cultural systems.

### Spotlight: In Canada, the first biosphere reserve entirely designed and managed by indigenous peoples

Located in Canada's Northwest Territories, the Tsá Tué Biosphere Reserve encompasses the Great Bear Lake, the last large pristine arctic lake on Earth. Boreal and taiga forest cover much of the watershed and host charismatic wildlife such as muskox, moose and caribou. The human residents of the site are the Sahtuto'ine, the 'Bear Lake People', the First Nation Dene, with about 600 people in the community of Déljñę.

The community established a Stewardship Committee in 2013 and led a designation process for Tsá Tué to be part of the World Network of Biosphere Reserves. The designation was celebrated in 2016 and a few months later the Canadian Government granted Déljñę self-government administration.

In 2015, the importance of the inclusion of indigenous peoples was added to the World Heritage Convention's Operational Guidelines. In the same year, the General Assembly of States Parties to the Convention adopted the Policy for the integration of a sustainable development perspective into the processes of the World Heritage Convention.

### *The International Indigenous Peoples' Forum for World Heritage*

The World Heritage Committee established in 2017 the International Indigenous Peoples' Forum for World Heritage. This forum's aim is to elevate the role of indigenous communities in the identification, conservation and management of World Heritage properties.

In 2019, the States Parties also included in the operational guidelines clauses in relation to ensuring indigenous peoples' free, prior and informed consent before the inclusion of a property in the national Tentative Lists.

All these important reforms are already producing visible effects in the nomination processes, in the conservation practices and effective management of several properties.



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# Advancing knowledge, finding solutions

Knowledge is paramount to address biodiversity challenges. As the UN's scientific organization, UNESCO advances research and knowledge sharing, supporting science programs and setting global standards for open science. The Organization harnesses its designated sites and programmes as a springboard to share solutions on sustainable use and conservation, based on scientific evidence as well as on local values and knowledge, to transmit to young people as drivers for change.

The UNESCO Global Recommendation on Open Science was adopted in 2021, providing an international framework for open science policy and practice. It aims to make scientific knowledge openly available, accessible, and reusable for everyone, to increase scientific collaborations and promote the free flow of ideas and scientific knowledge. All UNESCO programmes, networks and initiatives embrace the principles of open science.

## Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services

The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) is an independent body established in 2012 with the aim to provide the best-available scientific evidence on biodiversity and ecosystems services. Its goal is to inform better decisions and policy making on biodiversity, just like the work of the IPCC for climate change. UNESCO is one of the 4 founding members.

UNESCO's Local and Indigenous Knowledge Systems programme (LINKS) hosts the Technical Support Unit for the IPBES Task Force on Indigenous and Local Knowledge Systems. This is a key forum for the development and implementation of methods for IPBES' assessments, including by organizing a series of dialogue workshops that bring together indigenous peoples and local communities and assessment authors to share knowledge related to the assessment, such as use of biodiversity by indigenous peoples and local communities, challenges and threats to this sustainable use, the importance of traditional governance and management and ways forward for the future.

### Spotlight: IPBES reports

IPBES released two reports in July 2022 with support from UNESCO. The first, the IPBES values assessment, summarized the evidence on the valuation of nature and the different approaches to valuing nature's contributions to societies. The assessment also highlighted those decision-making processes that integrate indigenous and local knowledge with scientific knowledge have more just and sustainable social and ecological outcomes.

The second, the IPBES assessment of the Sustainable Use of Wild Species highlighted that, as billions of people rely on wild species for food, medicine, energy, and income, effective governance, institutions, and policies should be flexible enough to accommodate differences among species, practices, sites and scales. The assessment refers to UNESCO designated biosphere reserves as collaborative governance that engage key actors in a way that is meaningful for them. Therefore, biosphere reserves can ensure that decisions on sustainable use are equitable for all of these actors.



## The science of CO<sub>2</sub> absorption: carbon sinks under pressure

The forests of UNESCO World Heritage sites represent a total area of 69 million hectares, twice the size of Germany. UNESCO has undertaken a scientific assessment of the amounts of greenhouse gases emitted and absorbed by these forests, to better understand their role and the importance of protecting them.

The first report published in October 2021 states that they play a vital role in mitigating climate change by absorbing 190 million tons of CO<sub>2</sub> each year, comparable to about half the United Kingdom's annual CO<sub>2</sub> emissions from fossil fuels.

In addition to absorbing CO<sub>2</sub> from the atmosphere, they also store substantial amounts of carbon, approximately 13 billion tons. If all this stored carbon were to be released into the atmosphere as CO<sub>2</sub>, it would be akin to emitting 1.3 times the world's total annual CO<sub>2</sub> emissions from fossil fuels.

### *Forest Management: Real-time fire alerts ignite a new hope*

Although World Heritage sites are highly protected, the report also showed that 10 of 257 forests emitted more carbon than they captured between 2001 and 2020 - an alarming result. This has been caused by the clearance of land for agriculture, an increasing scale and severity of wildfires, and other extreme weather phenomena.

But better management of sites can yield results. For example, in Indonesia's World Heritage Forests, government agencies have been using near real-time fire alert systems to significantly reduce their average fire response time, which prevents fires from developing into destructive conflagrations that produce extensive CO<sub>2</sub> emissions.

While at the Sangha Trinational World Heritage site located across Cameroon, the Central African Republic and the Republic of Congo, the creation of a buffer zone around the site has kept some human activity farther from this important carbon sink.



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### Spotlight: the UNESCO x LVMH Amazon Project

With the aim of halting biodiversity loss, UNESCO and LVMH have joined forces to strengthen the link between scientific and participatory approaches in the Greater Amazon Basin.

The Amazon programme is addressing the direct and indirect drivers of deforestation in the Amazonian region within 8 biosphere reserves located in Bolivia, Brazil, Ecuador and Peru. It is based on participatory and inclusive approaches, combining scientific, local and indigenous knowledge. Two priorities have been set: the reforestation and rehabilitation of degraded lands, and the creation of sustainable employment and alternative sources of income.

For example, an initiative in the Beni Biosphere Reserve (Bolivia) aims to build a

greenhouse and provide families living in 4 communities with seeds of high-quality native timber species (mahogany) and crops (plantain, coffee, cocoa and citrus) to create plots under agroforestry systems in fallows, areas traditionally used for agriculture by local people.

In Yasuní biosphere reserve (Ecuador), a project seeks to empower young Kichwa people, a community in which plastic pollution has become a recurring problem. The project values a local association collecting and recycling plastic to improve their infrastructure, thus enhancing circular economy and reducing environmental impacts in the biosphere reserve while creating income and strengthening technical and marketing knowledge for young people.

## Assessing the impact of Climate Change on UNESCO World Heritage Glaciers

Glaciers are of critical importance for sustaining life and biodiversity on Earth. More than half of humanity depends on these natural water towers for domestic use, agriculture and hydropower.

World Heritage sites are home to around 18,600 glaciers spanning an area of about 66,000 km<sup>2</sup>. This represents around 10% of the Earth's glaciers, including the world's highest (next to Mt. Everest), the longest (in Alaska), and the last remaining glaciers in Africa (on Mt. Kilimanjaro and Mt. Kenya).

The future of these glaciers is under immediate threat: they are among the most affected ecosystems by climate change and global warming. All glaciers in World Heritage sites are retreating, and more than 60% of them are retreating at an accelerated rate.

### *A race against time to save Glaciers*

For the first time in 2022, UNESCO has also been able to quantify the extent of this retreat and its impact on global sea level rise: from 2000 to 2020, World Heritage glaciers lost on average some 58 billion tons of ice every year and contributed to almost 5% of global sea-level rise.

UNESCO projections indicate that glaciers in a third of World Heritage sites will disappear by 2050, regardless of the climate scenario. But there is reason to hope: if emissions are drastically cut to limit global warming to 1.5°C by 2100, glaciers within the other two-thirds of World Heritage sites could be saved.

By identifying knowledge gaps and improving monitoring networks, as well as designing and implementing early warning and disaster risk reduction measures, countries can make glaciers a focus of targeted policy and collaborate to save this dwindling but necessary resource for continued life on earth.

## Resilient Reefs: Shaping the future of climate adaptation

Coral reefs are critically important biodiverse ecosystems for the planet. Occupying less than 1% of the ocean floor, they support 25% of all marine life and the livelihoods and wellbeing of almost one billion people across 101 countries.

Right now, 75% of the planet's coral reefs are under threat from local stress factors and climate change. The impacts of a changing climate mean we are rapidly running out of time, and the scale and urgency of these challenges need new approaches.

29 UNESCO World Heritage sites are home to coral reefs that cover over 500,000km<sup>2</sup> worldwide – roughly the size of France – exhibiting exceptional biodiversity. In 2018, UNESCO launched the Resilient Reefs Initiative to work actively on the adaptation of these reefs to climate change.

### *Coral reproduction techniques*

The Resilient Reefs Initiative brings together local communities, reef managers and resilience experts to conduct research and pilot projects. For example, in the Southern Lagoon of the Rock Islands (Palau), it materializes by the design of a fishing permit system to control access, the implementation of fish size limits to increase spawning biomass, and the protection of habitats.

On Australia's Ningaloo Coast, the Initiative is developing solutions to facilitate coral reproduction, by fitting small star-shaped structures made of steel bars onto the reef which allow fertilized eggs to settle and grow.

The first four-year phase covered 4 sites in Australia, Belize, France (New Caledonia) and Palau, with a total budget of \$10 million. In April 2022, UNESCO launched a second phase as part of a partnership with the UN-led private/public Global Fund for Coral Reefs, which will extend the actions to 19 reefs sites.



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## EDNA: A game-changing technology to map marine life

In 2022, UNESCO launched a global citizen science initiative to collect Environmental DNA (known as eDNA), that helps measure marine biodiversity, and the impacts climate change might have on the distribution patterns of marine life, across UNESCO World Heritage marine sites.

Samples are collected by citizens living near Marine World Heritage sites who learn the skills necessary to appreciate and preserve the biodiversity of their local environments. Then scientists standardize eDNA sampling to make results interoperable and comparable. Those processes are validated by an international scientific advisory board and shared publicly.

A central part of the initiative is to promote open science and full open access to data. All the data resulting from the expeditions will be openly available on UNESCO's Ocean Biodiversity Information System (OBIS), the world's largest open-access data system on the marine species.

### Spotlight: supporting young researchers

Since 1989, UNESCO MAB has supported young researchers through research grants in their scientific work on ecosystems, natural resources and biodiversity. Almost 350 young researchers have already received the MAB Young Scientist Award. MAB is investing in a new generation of scientists worldwide because well-trained and committed young people are key to addressing ecological and sustainability issues.



## Leading and developing ocean biodiversity science

The Intergovernmental Oceanographic Commission of UNESCO (IOC) is the United Nations body responsible for supporting global ocean science and services. The IOC enables its 150 Member States to work together to protect the health of our shared ocean by coordinating programmes in areas such as ocean observation, tsunami warning and marine spatial planning.

Since it was established in 1960, the IOC has provided a focus for all other United Nations bodies that are working to understand and improve the management of our oceans, coasts and marine ecosystems.

Today, the UNESCO's IOC is supporting all its Member States to build their scientific and institutional capacity in order to achieve the global goals including the UN Agenda 2030 and its Sustainable Development Goals,

### Spotlight: OBIS, an open-access data and information clearing-house on marine biodiversity

Since 2000, the UNESCO's Ocean Biodiversity Information System (OBIS) is the world's most comprehensive database on the diversity, distribution, and abundance of life in the ocean. OBIS is a collective effort by thousands of scientists and data managers employed by hundreds of institutions around the world, who ensure that the scientifically researched, collated and published data adheres to the highest internationally recognized standards. Thanks to OBIS, more than 100 million marine species observations are now into the public domain.

The completion of this database is accelerating more and more. With new biodiversity monitoring technologies such as molecular tools (environmental DNA), acoustics (tracking animals) and imaging (plankton), OBIS now receives the same amount of new data in a single year that was previously generated in a decade.

the Paris Agreement on Climate Change and the Sendai Framework on Disaster Risk Reduction.

The IOC is working to achieve the following Objectives:

- Healthy ocean and sustained ocean ecosystem services;
- Effective warning systems and preparedness for tsunamis and other ocean-related hazards;
- Resilience to climate change and contribution to its mitigation;
- Scientifically-founded services for the sustainable ocean economy;
- Foresight on emerging ocean science issues.

Under the lead of UNESCO's IOC, the Ocean Decade (2021-2030) supports and connects the science and innovation urgently required to reverse the decline of the marine ecosystem and its biodiversity.

## UNESCO Global Geoparks Network: linking geology and biodiversity

In 2004, UNESCO created the Global Geoparks Network, a powerful tool to improve understanding of earth. Global Geoparks are single, unified geographical areas of international geological significance.

The purpose of a UNESCO Global Geopark is to explore, develop and celebrate the links between that geological heritage and all other aspects of the area's natural, cultural and intangible heritages. It is about reconnecting human society to the planet we all call home and to celebrate how our planet and its 4,600-million-year long history has shaped our lives and societies.

UNESCO global geoparks empower local communities and give them the opportunity to develop cohesive partnerships with the common goal of promoting the area's significant geological processes, features, periods of time, historical themes linked to geology, or outstanding geological beauty.

At present, there are 177 UNESCO Global Geoparks in 46 countries.





**Spotlight: M'Goun UNESCO Global Geopark (Morocco)**  
**"Valleys, natural curiosities, fossilised footprints, engravings and authentic Berber villages"**

The M'Goun UNESCO Global Geopark is located in the middle of the chain of the central High Atlas Mountains. The geological history of the territory fits into the geological evolution of the central High Atlas dating back to the Triassic period, 250 million years ago. It includes geological structures resulting from the collision of the African and European plates, spectacular footprints of sauropod and theropod dinosaurs and many deposits of bones.

This Geopark fits into the area of geobiodiversity development by attracting and helping to develop responsible mountain tourism at large and geo-ecotourism in particular. The georoutes and the geotopes allow visitors to visit the entire territory and to visit for longer period of time, which benefits local people.

## UNESCO Earth Network

The UNESCO Earth Network is a mentorship program designed to tackle issues related to biodiversity loss, ocean and land degradation, and climate change adaptation and mitigation. UNESCO launched the International Network of Environmental Experts with support from Italy in 2020, with a global resource mobilization target of US \$20 million over an initial period of 4 years.

It brings together early career professionals in the field of ecological restoration to support UNESCO protected sites, encourage research and create sponsorships with senior experts. The program supports training workshops, Massive Open Online Courses (MOOCs) and scientific publications. It offers an international cooperation platform in the area of biodiversity, the ocean and climate change between experts and UNESCO Member States.

Within the framework of the Earth Network programme, UNESCO supports the creation of the first interdisciplinary database of key socio-ecological, biodiversity, climate change and governance data on UNESCO-designated sites, facilitating site management, planning of activities, evaluation of results and sharing of good practices and indigenous and local knowledge.

Scientific indicators are available to monitor changes on the ground (e.g. land use and land cover), disaster risk reduction challenges (fire, pollution, deforestation, poverty, insecurity, loss of culture and languages) and impacts on biodiversity, climate and people's livelihoods, including contributions to women, youth and priority areas.

### Spotlight: Marine invasive species monitoring system (PacMAN)

The introduction of non-indigenous species to new environments is one of the five key drivers impacting biodiversity, according to the IPBES global assessment. Small Island Developing States (SIDS) are particularly vulnerable to such a risk.

Through the "Pacific Islands Marine Bioinvasion Alert Network (PacMAN)", UNESCO develops a marine invasive species monitoring system in high-risk areas utilizing the latest technologies in genomics and metabarcoding (such as environmental DNA). Through scientific training courses, PacMAN also increases the local technical and scientific capacity in using advanced molecular technologies.

As the first port of call, biodiversity surveys and targeted species detections are being tested in the port of Suva, Fiji, with the aim to develop an operational monitoring system with regular samplings, that could be transferred to other Pacific states or other regions.



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There is only one planet, not one for us and one for nature. Faced with the decline of biodiversity, climate change and the intensification of natural disasters, we have a collective responsibility to change course and restore our relationship with the living. Making peace with nature calls for a deep change in behaviours and values through education, science, culture and information. It calls for a concerted, deliberate and global effort. UNESCO has a wealth of experience and designated sites that can contribute to tackling this challenge.



Learn more about  
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