



unesco



PEOPLE AND NATURE IN UNESCO-DESIGNATED SITES

Global and local contributions

Published in 2026 by the United Nations Educational, Scientific and Cultural Organization (UNESCO), 7, place de Fontenoy, 75352 Paris 07 SP, France.

© UNESCO, 2026

ISBN: 978-92-3-100865-8

DOI: <https://doi.org/10.54677/XZIC3423>



This publication is available in Open Access under the Attribution-ShareAlike 3.0 IGO (CC-BY-SA 3.0 IGO) license (<http://creativecommons.org/licenses/by-sa/3.0/igo/>). By using the content of this publication, the users accept to be bound by the terms of use of the UNESCO Open Access Repository (<https://www.unesco.org/en/open-access/cc-sa>).

Images marked with an asterisk (*) do not fall under the CC-BY-SA license and may not be used or reproduced without the prior permission of the copyright holders.

The designations employed and the presentation of material throughout this publication do not imply the expression of any opinion whatsoever on the part of UNESCO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

The ideas and opinions expressed in this publication are those of the authors; they are not necessarily those of UNESCO and do not commit the Organization.

Cover design, graphic design and illustrations: Ana K. Landi | Diecut is Design

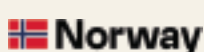
Lead authors: Tales Carvalho Resende, Martin Delaroche

Technical contributors: Rob Alkemade, Rodrigo Aguayo, Liam Bailey, Michel Bakkenes, Céline Bellard, Guolong Chen, Kalkidan Chefira, Stefanie Deinet, Fabrice Dubertret, Kurt Fesenmyer, Robin Freeman, David Gibbs, Enric Gomis, Huadong Guo, Sam Hill, Jelle Hilbers, Romain Hugonnet, Sijia Huo, Alvaro Iribarrem, Ravi Jammalamadaka, Walter Jetz, Alex Killion, Johannes Krause, Samantha Kuzma, Agnieszka Latawiec, Jie Liu, Shaobo Liu, Valentina Marconi, Clara Marino, Cory Merow, Johan Meijer, Louise McRae, Bruna Pavani, Henrique Pereira, Adriana de Palma, Alex Pigot, Andy Purvis, Luise Quoß, Melissa Rose, Patrick Schmitt, Aafke Schipper, Oscar Serrano, Bernardo Strassburg, Christopher Trisos, Lander Van Tricht, Adam Wilson, Ruixia Yang, Harry Zekollari.

Acknowledgments: Antonio Abreu, Bernardo Aliaga, Armelle Arrou, Fernando Avakian, Patrycja Breksvar, Lidia Brito, Amandine Callens, María Rosa Cardenas, Nigel Crawhall, Sofia Delger, Dorine Dubois, Lazare Eloundou Assomo, Manoel Giffoni, Maximilien Guèze, Serena Heckler, Julia Heiss, Jyoti Hosagrahar, Anna Juncadella, Joseph Karanja, Susanna Kari, Ozlem Lopes, Matilda Machimura, Gustavo Merino, Ana Norata, Ernesto Ottone, Berta de Sancristobal, Hans Thulstrup, Carlos Uribe, Kristof Vandenberghe, François Wibaux, Soichiro Yasukawa, Wei Yu, Melisa Yorgancioglu.

Suggested citation: UNESCO (2026). *People and Nature in UNESCO-designated Sites: Global and Local Contributions*. Paris, France: UNESCO. <https://doi.org/10.54677/XZIC3423>

This publication was made possible thanks to the generous contribution of the French Biodiversity Office (OFB), Jeju Special Self-Governing Province, the Government of Flanders (Belgium), the Government of Norway, the Principality of Monaco, and the Trilateral Wadden Sea Cooperation (TWSC).



SHORT SUMMARY

UNESCO-DESIGNATED SITES: DELIVERING TANGIBLE BENEFITS FOR PEOPLE AND NATURE

World Heritage sites, Biosphere Reserves, and Global Geoparks form a unique global network of more than 2,260 sites across over 13 million km². These living landscapes support the livelihoods of some 900 million people worldwide —around 10% of the global population, including many Indigenous Peoples and local communities— while harbouring a significant share of global biodiversity and contributing to climate regulation.

This first global assessment shows that UNESCO-designated sites are delivering tangible results for both people and nature, even in the face of increasing pressures. They represent a resilient model in which human well-being and environmental protection advance together, and offer practical, place-based responses to the intertwined challenges of climate change and biodiversity loss.

Within these landscapes, safeguarded over generations through local stewardship, monitored wildlife populations have remained stable on average, in stark contrast to the 73% global decline in monitored species since 1970.

By failing to act now, pressures will intensify and natural systems in more than one in four sites could reach critical tipping points by 2050, potentially undermining both ecosystems and the communities that depend on them.

Every 1°C of warming avoided could halve the number of sites exposed to major disruption by the end of the century. Scaling up integrated management, restoration, inclusive governance, and targeted policies, alongside increased investment, is essential to sustain and expand these proven approaches and strengthen their resilience.

UNESCO-designated
sites strengthen the
resilience of vital
ecosystems sustaining

900 MILLION
people worldwide

UNESCO-DESIGNATED SITES: DELIVERING



WORLD HERITAGE (WH)



BIOSPHERE RESERVE (BR)



GLOBAL GEOPARK (GP)



900 million
people
live in and around
UNESCO-designated sites



2,260+
UNESCO-designated
sites



UNESCO-designated
sites span over
13 million km²
an area larger than
China and India combined



175+
countries



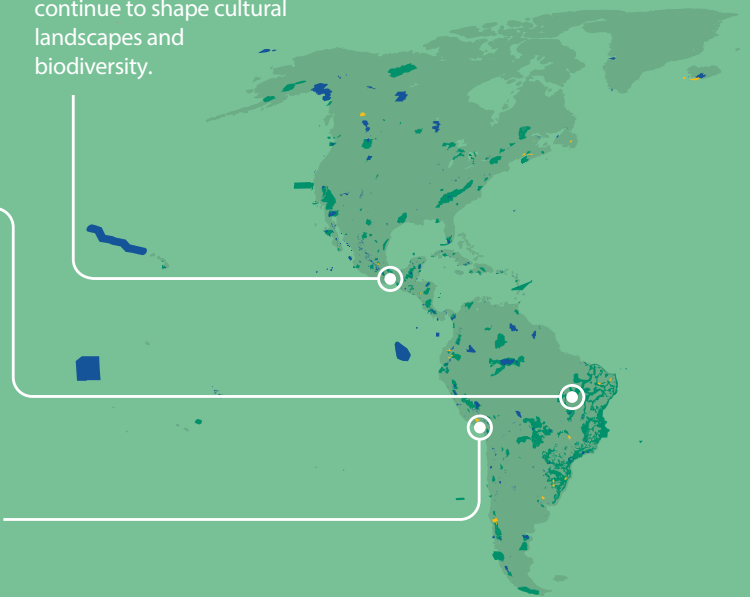
The Mata Atlântica (BR), one of the world's most biodiverse landscapes, stretches along Brazil's Atlantic coast. At its heart, **Araripe (GP)** showcases exceptional fossil heritage. A constellation of **World Heritage sites**—from historic cities like Salvador, Olinda and Ouro Preto to Rio de Janeiro, Paraty, and natural wonders spanning oceans (Fernando de Noronha), forests (Atlantic Forests), caves (Peruaçu), and waterfalls (Iguaçu)—reflects centuries of creativity, devotion, and harmony between people and nature.



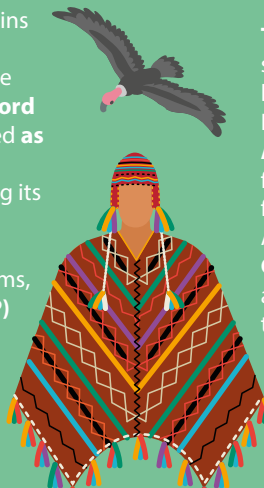
The Tehuacán-Cuicatlán Valley (WH, BR, GP) in Mexico is the most biodiverse semi-arid zone in North America, with the world's densest forests of columnar cacti. It is also a cradle of maize domestication, where Indigenous communities developed irrigation and farming practices that continue to shape cultural landscapes and biodiversity.



The **Azores (GP)** in Portugal are volcanic islands where craters, lakes, and marine ecosystems sustain whales, seabirds, and rich biodiversity. Human life is closely tied to nature, from **Pico's lava-stone vineyards (WH)** to the whaling heritage that has transformed into whale watching, reflecting evolving bonds between culture and environment.



The Qhapaq Ñan, Andean Road System (WH) embodies the vast Inca network linking peoples and landscapes across South America. In Peru, it remains a cultural backbone, connecting traditions like the **Pilgrimage to the Lord of Qoyllurit'i**, recognized as **UNESCO Intangible Cultural Heritage**. Along its routes, numerous **Biosphere Reserves** safeguard vital ecosystems, while the **Imbabura (GP)** highlights the geological forces shaping the Andean corridor.



The Oasis du Sud Marocain (BR) safeguards fragile desert ecosystems that have long supported life and agriculture. Embedded within it, the **Ksar of Ait-Ben-Haddou (WH)** is a XII-century fortified village that once thrived as a hub for caravans on the trans-Saharan routes. Adjacent, the **M'Goun (GP)** and the **Atlas Cedar (BR)** highlight the geological and ecological richness of the High Atlas.



TANGIBLE BENEFITS FOR PEOPLE AND NATURE



The Pyrenees form a cultural and natural crossroads between Spain and France. The **Ordesa-Viñamala (BR)** conserves emblematic ecosystems and pastoral practices, while the **Sobrarbe-Pirineos (GP)** reveals the geological forces shaping valleys and peaks. At their heart, the **Pyrénées-Mont Perdu (WH)** and the **Routes of Santiago de Compostela (WH)** highlight the mountains as places of encounter, pilgrimage, and exchange.



The **Silk Roads: Chang'an-Tianshan Corridor (WH)** illustrates how trade and cultural exchange were shaped by the landscapes of Central Asia. Along these routes, the **Almaty (BR)** safeguards Tien Shan ecosystems that sustained travelers and communities, while the **Dunhuang and Linxia (GP)** showcase the geological formations that defined these historic corridors.



Jeju Island (WH, BR, GP) in the Republic of Korea showcases volcanic landscapes from Mount Hallasan to lava caves and coastal cliffs. They harbor unique species such as the Jeju salamander and vibrant soft corals, alongside traditions like the haenyeo women divers, whose skills and knowledge illustrate human adaptation to marine environments.



Mount Huangshan (WH, BR, GP) is one of China's most celebrated landscapes, famed for its granite peaks, ancient pines, and seas of clouds that have inspired artists and poets for centuries.

The **Tropical Rainforest Heritage of Sumatra (WH)** showcases one of the world's richest forest ecosystems. Within it, the **Gunung Leuser (BR)** protects iconic biodiversity including orangutans, while the **Merangin Jambi and Toba Caldera (GP)** highlight the island's geological history.



The **Serengeti-Ngorongoro Area (WH, BR, GP)** in Tanzania is an iconic savanna ecosystem, renowned for the Great Migration, one of our planet's last intact animal migrations. Each year, millions of wildebeest, zebras, and gazelles traverse its plains in search of greener grazing grounds as the dry season shifts. The Maasai people maintain pastoral traditions on the periphery, balancing grazing with wildlife conservation.



73%

While global monitored wildlife populations have declined by 73% since 1970, those within UNESCO-designated sites comparatively **stable**.



700 MtCO₂

absorbed (net) each year, equivalent to Germany's annual emissions from fossil fuels.



3 MILLION km²

Key Biodiversity areas (KBAs), areas of international importance for biodiversity conservation covering an area equivalent to India.



over 60%

of all globally mapped species can be found in UNESCO-designated sites.

PEOPLE AND NATURE IN UNESCO-DESIGNATED SITES

Global and local contributions



TABLE OF CONTENTS

INTRODUCTION	
1. CONNECTING PEOPLE AND NATURE	10
DIVERSE MISSIONS, COMPLEMENTARY ROLES	11
WORLD HERITAGE SITES: PROTECTING OUTSTANDING HERITAGE	12
BIOSPHERE RESERVES: MOBILIZING KNOWLEDGE FOR PEOPLE AND BIODIVERSITY	13
UNESCO GLOBAL GEOPARKS: CELEBRATING EARTH'S GEOLOGICAL HERITAGE, SUSTAINING LOCAL COMMUNITIES	14
A WORLDWIDE NETWORK OF SITES: LOCALLY ROOTED, GLOBAL IMPACT	15
MULTI-DESIGNATED AREAS: RECOGNIZING EXCEPTIONAL PLACES	16
SUPPORTING LIVELIHOODS AND ECONOMIES	17
INDIGENOUS KNOWLEDGE, ANCESTRAL PLACES	18
CROSSROADS OF LIVING HERITAGE	20
2. LIFELINES FOR A SUSTAINABLE FUTURE	22
WHY NATURE MATTERS	23
TESTIMONIES OF EARTH'S HISTORY	24
ADAPTING TO ENVIRONMENT, SHAPING LANDSCAPES	25
NATURE AS A DRIVER OF HUMAN INGENUITY	26
STRONGHOLDS OF NATURE	28
REGULATING THE CLIMATE	29
AN OUTSTANDING BIODIVERSITY	30
A HAVEN FOR ICONIC FAUNA AND FLORA	31
CRITICAL PLACES TO PROTECT GLOBALLY THREATENED SPECIES	32
VITAL STEPPING STONES FOR MIGRATORY SPECIES	33
3. RESILIENT SITES UNDER INTENSIFYING PRESSURE	34
LANDSCAPES AT RISK	35
EVOLVING PRESSURES, EMERGING RISKS	36
RESILIENCE IN A CHANGING WORLD	37
A WARMING CLIMATE, GROWING CHALLENGES	38
ESCALATING PRESSURES, ENDURING IMPACTS	39
APPROACHING CRITICAL TIPPING POINTS	40
PATHWAYS FOR ACTION	41
CONCLUSION	50
BIBLIOGRAPHY	52
TECHNICAL CONTRIBUTORS	57

INTRODUCTION

This report presents the first global assessment examining all UNESCO-designated sites—World Heritage sites, Biosphere Reserves, and Global Geoparks—as a single interconnected network. It provides the most comprehensive evidence to date of the collective value of this global network, built by the international community over more than 50 years.

The report offers a comprehensive understanding of how UNESCO-designated sites sustain interconnected ecological systems and human societies. It examines their global distribution and historical evolution, assesses their contributions, reviews current conditions, and considers how these sites may evolve in the future.

The findings of this report are grounded in a significant technical and scientific effort, mobilizing expertise across disciplines and regions, while recognizing the knowledge and stewardship of communities living in and around these sites. The report draws on contributions from more than 20 leading research institutions and scientific teams worldwide and builds on a large body of peer-reviewed research. It is further underpinned by a major effort to assemble, digitalize, and harmonize geospatial data from all designated sites into a single standardized global database, reconciling decades of information, some dating back to the early 1970s.

The report is structured around three key dimensions:

- First, it explores how sites support livelihoods, cultures, and systems of knowledge, including those of Indigenous Peoples and local communities. It outlines the role of each designation while emphasizing their complementarity, as each reflects a distinct dimension of the relationship between societies and the natural world.
- Second, it highlights the contributions UNESCO-designated sites have made—historically and today—across all biomes of the planet. These sites provide unique opportunities to understand Earth's geological and human history, while also supporting biodiversity conservation, climate regulation, and the protection of migratory and threatened species.
- Finally, it examines how UNESCO-designated sites are responding to growing pressures. Despite increasing environmental stress from human activities, including climate change, many of these sites continue to demonstrate resilience. This section also identifies key pathways for strengthening their contributions and addressing emerging challenges, while reinforcing their role as hubs for research, knowledge generation, and education for sustainable development..

Together, this integrated analysis provides a global perspective on UNESCO-designated sites as interconnected systems, underscoring their significance and resilience as reflected in their capacity to withstand, adapt to, and recover from accelerating change, while highlighting the challenges they face in a rapidly changing world.

CONNECTING PEOPLE AND NATURE

1

DIVERSE MISSIONS, COMPLEMENTARY ROLES

For over half a century, UNESCO has promoted an international framework for recognizing and safeguarding areas of outstanding value for conservation, scientific knowledge, and sustainable development. Within this framework, three complementary global site designations have been established under UNESCO conventions and programmes: **World Heritage sites (WH)**, **Biosphere Reserves (BR)**, and **Global Geoparks (GP)**.

Each designation addresses a distinct dimension of the relationship between people and nature, cultural and natural values, ecosystems, or geological heritage, while collectively advancing conservation, sustainable development, and knowledge co-production. A shared vision of safeguarding exceptional places for present and future generations.



WORLD HERITAGE SITES: PROTECTING OUTSTANDING HERITAGE

Provide the highest level of international protection to places of Outstanding Universal Value (OUV), both natural or cultural, ensuring their preservation for present and future generations.



BIOSPHERE RESERVES: MOBILIZING KNOWLEDGE FOR PEOPLE AND BIODIVERSITY

Integrate biodiversity conservation with the sustainable use of natural resources, acting as learning landscapes for innovative interdisciplinary practices and community-driven solutions.



UNESCO GLOBAL GEOPARKS: PROMOTING EARTH'S GEOLOGICAL HISTORY

Promote and safeguard Earth's geological history by recognizing territories of international geological significance, while leveraging Earth science for education and sustainable local development.



2,260 +
UNESCO-designated sites



175 +
countries



UNESCO-designated sites span over
13 million km²
an area larger than China and India combined



900 million
people
live in and around UNESCO-designated sites

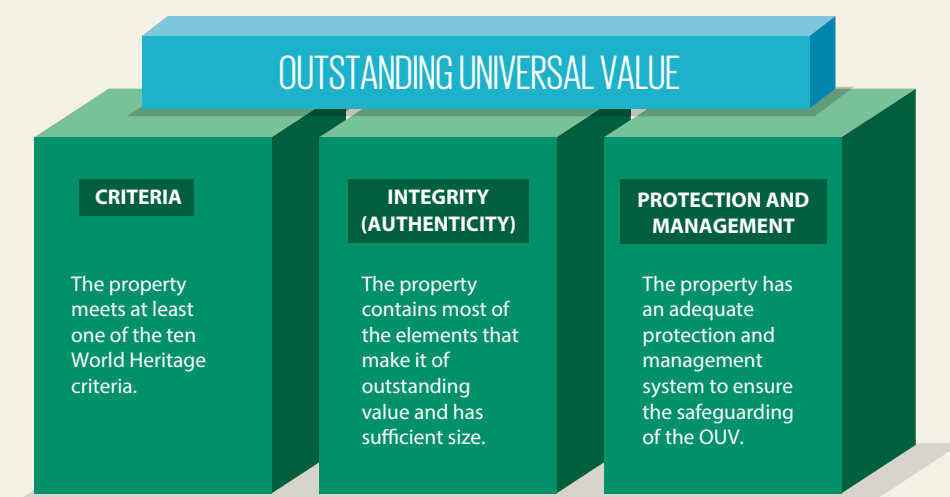
WORLD HERITAGE SITES: PROTECTING OUTSTANDING HERITAGE



The **1,240+** World Heritage sites¹ — about 3/4 cultural and 1/4 natural—represent the most numerous UNESCO designation, protecting cultural and natural heritage considered to be of outstanding universal value to humanity.

The **Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention)**, adopted in 1972 and ratified by 196 countries to date, constitutes an international legal treaty for the identification and protection of humanity's most significant heritage sites.

Sites are inscribed on UNESCO's World Heritage List based on their **Outstanding Universal Value (OUV)**, meaning that their importance **transcends national boundaries** and that they are considered significant **for present and future generations of all humanity**.



The World Heritage Convention is unique in combining the protection of both **cultural and natural heritage** within a single international instrument, providing the highest level of global recognition and fostering scientific cooperation for the conservation and management of these exceptional places.

CULTURAL CRITERIA

- Masterpiece of human creative genius
- Interchange of human values in architecture, technology, monumental arts, town-planning, or landscape design
- Unique testimony to a cultural tradition or civilization
- Building, architecture or landscape representing a major stage in human history
- Traditional settlement or human interaction with environment
- Association with events, traditions, ideas, beliefs, or artistic works



NATURAL CRITERIA

- Exceptional natural beauty or phenomena
- Major stages of Earth's history, geological processes or landforms
- Ongoing ecological and biological processes
- Conservation of biodiversity and habitats of threatened species

1- <https://whc.unesco.org/>

BIOSPHERE RESERVES: MOBILIZING KNOWLEDGE FOR PEOPLE AND BIODIVERSITY



The **780+ Biosphere Reserves**² cover the largest area (>7.5 million km²) of UNESCO-designated sites. Owing to their large spatial extent and unique zonation, which combine nature conservation and sustainable use, they often overlap with and encompass World Heritage sites and Global Geoparks.

The Man and The Biosphere (MAB) Programme was launched in 1971 with the main goal of improving the relationship between people and nature through sound scientific research, conservation, and community participation. The Programme coordinates the World Network of Biosphere Reserves, a global network of designated areas that serve as “learning places” for sustainable development.

UNESCO biosphere reserves are working models for a sustainable future, demonstrating how humanity can live in productive harmony with nature. For half a century, they have been guided by a core belief: effective conservation is inextricably linked to sustainable development and must be powered by both cutting-edge science and the dynamic knowledge of Indigenous Peoples and local communities.

Biosphere reserves articulate three functions and present detailed territorial planning, pursued through the site's zonation.

- (A) CORE AREA:** Legally protected zone dedicated to long-term biodiversity conservation.
- (B) BUFFER ZONE(S):** Area supporting education, research, monitoring, and other activities that reinforce conservation objectives.
- (C) TRANSITION AREA(S):** Space for community-driven sustainable development and innovative economic practices.



GLOBAL AVERAGE PROPORTION OF ZONES



2- <https://www.unesco.org/en/mab>

UNESCO GLOBAL GEOPARKS: CELEBRATING EARTH'S GEOLOGICAL HERITAGE, SUSTAINING LOCAL COMMUNITIES



Through **220+** Global Geoparks³ the world's geological heritage is actively protected and celebrated as vital in shaping landscapes, biological diversity, nurturing ecosystems, and sustaining human societies.

Established in 2015, the UNESCO Global Geopark label recognizes sites that are **scientifically and culturally significant**, showcasing Earth's geological heritage while ensuring their protection and sustainable management for future generations. This concept builds on the 1991 Digne Declaration, which emphasized humanity's right—and responsibility—to remember and safeguard Earth's geological heritage.



With internationally significant geological heritage, diverse cultures, and a range of climatic and ecological settings, **UNESCO Global Geoparks** showcase remarkable territories shaped by geological processes and formations. They are managed through a holistic approach to protection, education, and sustainable development, while promoting cultural heritage, community pride, geotourism, and local innovation.

THE FOUR ESSENTIAL COMPONENTS OF GLOBAL GEOPARKS

GEOLOGICAL HERITAGE OF INTERNATIONAL VALUE

A UNESCO Global geopark must contain geological heritage of international importance, assessed by independent experts through research and field evaluation.

MANAGEMENT

A legally recognized body manages the geopark with an inclusive management plan balancing community needs.



NETWORK

Geoparks connect locally and globally, exchanging experience and fostering cooperation and peace.



VISIBILITY

Clear information, branding, and tools make the geopark accessible and support geotourism.

What makes UNESCO Global Geoparks **unique**?



COMMUNITY-DRIVEN VISION

Local communities, partners, local and central governments define a **shared vision** before applying for UNESCO status.



INTEGRATED IDENTITY

Geoparks **connect** geological heritage with cultural heritage, fostering innovation and creativity.



LIVING TERRITORIES

Active territories where communities **interact** with and conserve Earth's geological heritage, fostering sustainable practices and cultural engagement.



LEARNING AND SUSTAINABLE DEVELOPMENT HUBS

Open-air classrooms that create **opportunities** for education, local development, and sustainable economic growth.



ADAPTIVE GOVERNANCE

Managed through **flexible**, community-led approaches that enable practical, long-term impact.

3- <https://www.unesco.org/en/igpp/geoparks/about>

A WORLDWIDE NETWORK OF SITES: LOCALLY ROOTED, GLOBAL IMPACT

1971

Creation of the Man and Biosphere (MAB) programme

1972

Adoption of the World Heritage Convention

1976

1ST BIOSPHERE RESERVE designated

1978

1ST WORLD HERITAGE SITE inscribed

1996

500TH WORLD HERITAGE SITE inscribed

2006

500TH BIOSPHERE RESERVE designated

2014

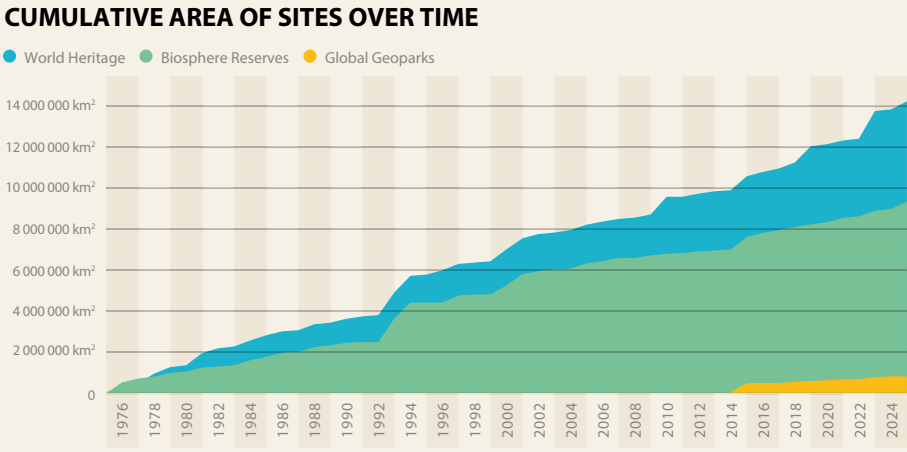
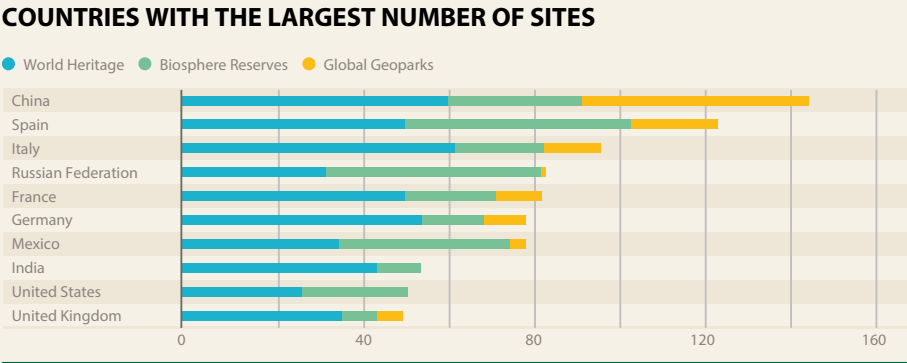
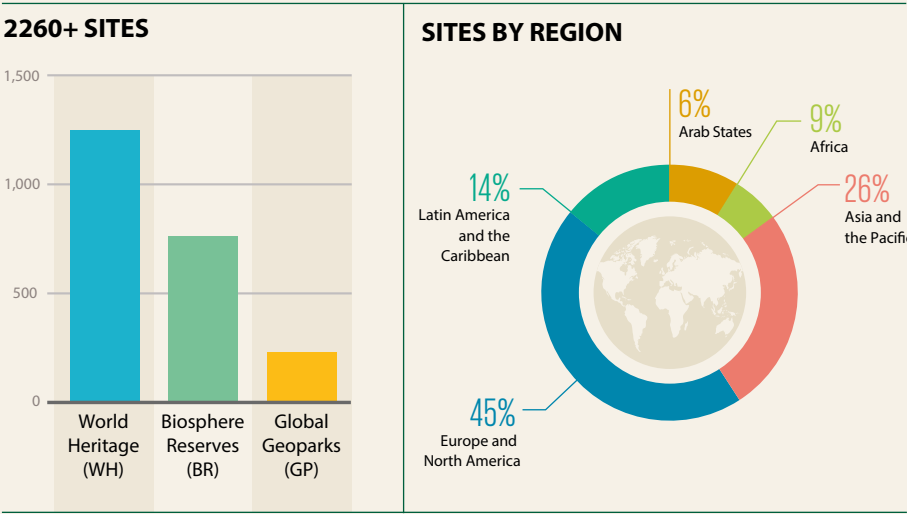
1000TH WORLD HERITAGE SITE inscribed

2015

Establishment of the International Geoscience and Geoparks Programme (IGGP)

2024

200TH GLOBAL GEOPARK designated



LARGEST SITES

SITE	COUNTRY	DESIGNATION	AREA (km²)
French Austral Lands and Seas	France	WH World Heritage Site	1,662,671 km²
Mata Atlântica	Brazil	BR Biosphere Reserve	896,870 km²
Cerrado	Brazil	BR Biosphere Reserve	762,398 km²
Phoenix Islands Protected Area	Kiribati	WH World Heritage Site	408,250 km²
Papahānaumokuākea	USA	WH World Heritage Site	362,075 km²
Great Barrier Reef	Australia	WH World Heritage Site	348,700 km²
Alxa Desert	China	GP Global Geopark	270,000 km²
Pantanal	Brazil	BR Biosphere Reserve	264,176 km²
Aïr and Ténéré	Niger	BR Biosphere Reserve	240,000 km²
Central Amazon	Brazil	BR Biosphere Reserve	197,030 km²

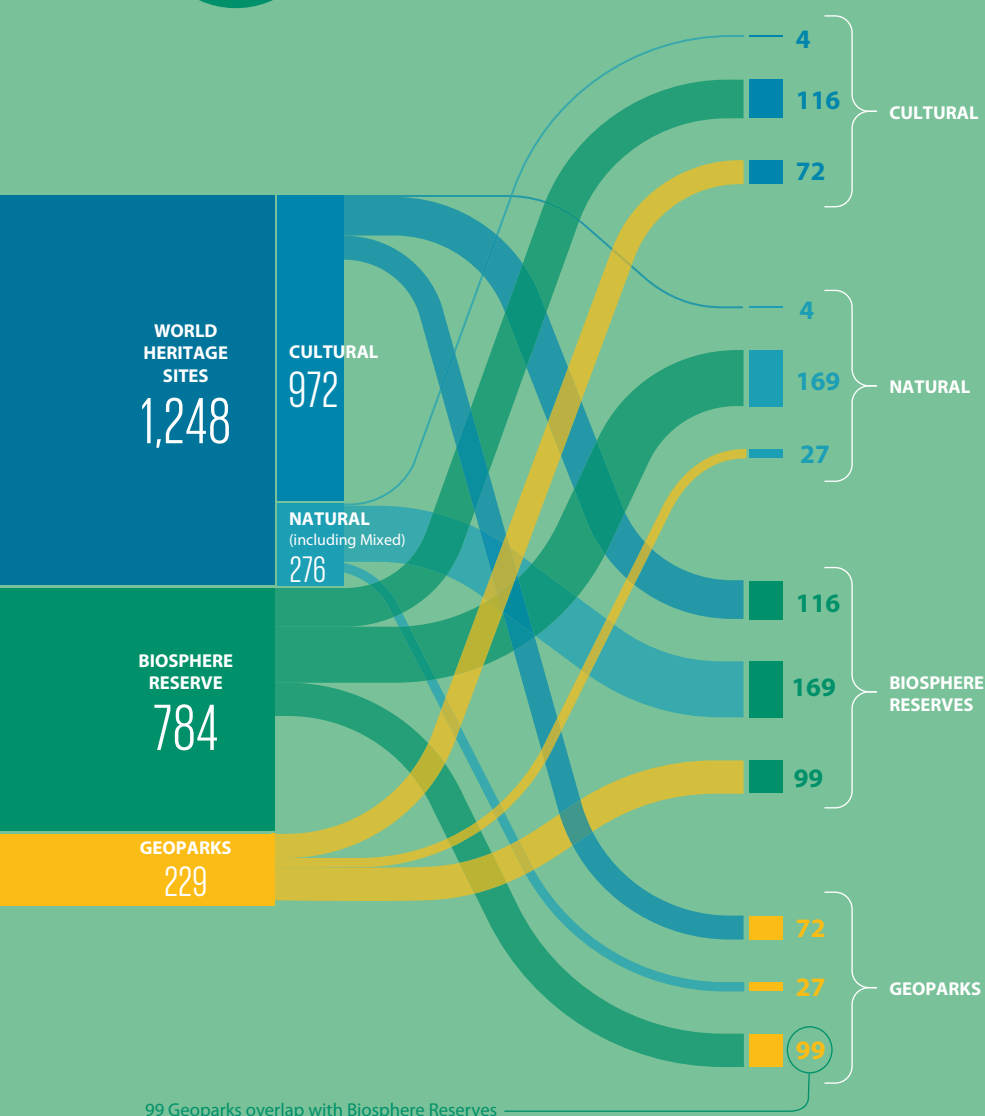
MULTI-DESIGNATED AREAS: RECOGNIZING EXCEPTIONAL PLACES

Some areas of UNESCO-designated sites are so unique that they are recognized through more than one UNESCO designation. Rather than duplicating efforts, these overlapping designations reflect complementary roles, allowing multiple dimensions of people–nature relationships to be recognized and managed together.

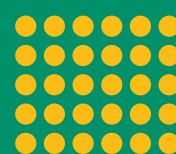


OF UNESCO-DESIGNATED SITES

include areas recognized under **more than one designation**, with overlaps⁴ representing almost **850,000 km²**.



99 Geoparks overlap with Biosphere Reserves



+30

sites include areas under three designations



© Haenyeo Museum*

Jeju Island (WH, BR, GP) in the Republic of Korea showcases volcanic landscapes from Mount Hallasan to lava caves and coastal cliffs. They harbor unique species such as the Jeju salamander and vibrant soft corals, alongside traditions like the haenyeo women divers, whose skills and knowledge illustrate human adaptation to marine environments.



© Maison de la transhumance*

The Pyrénées form a cultural and natural crossroads between Spain and France. The **Ordesa– Viñamala (BR)** conserves emblematic ecosystems and pastoral practices, while the **Sobrarbe Pirineos (GP)** reveals the geological forces shaping valleys and peaks. At their heart, the **Pyrénées Mont Perdu (WH)** and the **Routes of Santiago de Compostela (WH)** highlight the mountains as places of encounter, pilgrimage, and exchange.



© Thomas Brissaud / Shutterstock.com*

The **Serengeti–Ngorongoro (WH, BR, GP)** landscape in Tanzania is an iconic savanna ecosystem, renowned for the Great Migration, one of the planet's last great animal migrations. Each year, millions of wildebeest, zebras, and gazelles cross its plains following seasonal rains. The landscape is shaped by the Great Rift Valley, with volcanic plains and the Ngorongoro Crater—an ancient caldera—whose fertile soils sustain rich grasslands and wildlife. In this landscape, the Maasai people maintain their unique culture and pastoral way of life.

About

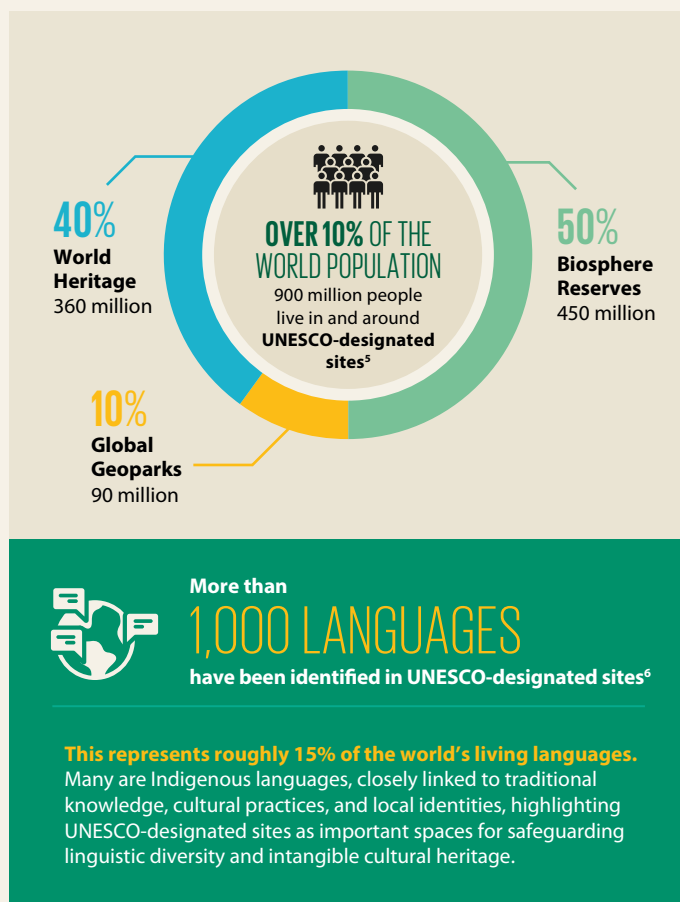


of **natural World Heritage sites** are located within the core areas of Biosphere Reserves, reflecting their shared role in strict conservation



OVER 80% of **Global Geoparks** have multi-designated areas, underscoring the close interrelationship between cultural heritage, natural environments, and geological features

SUPPORTING LIVELIHOODS AND ECONOMIES



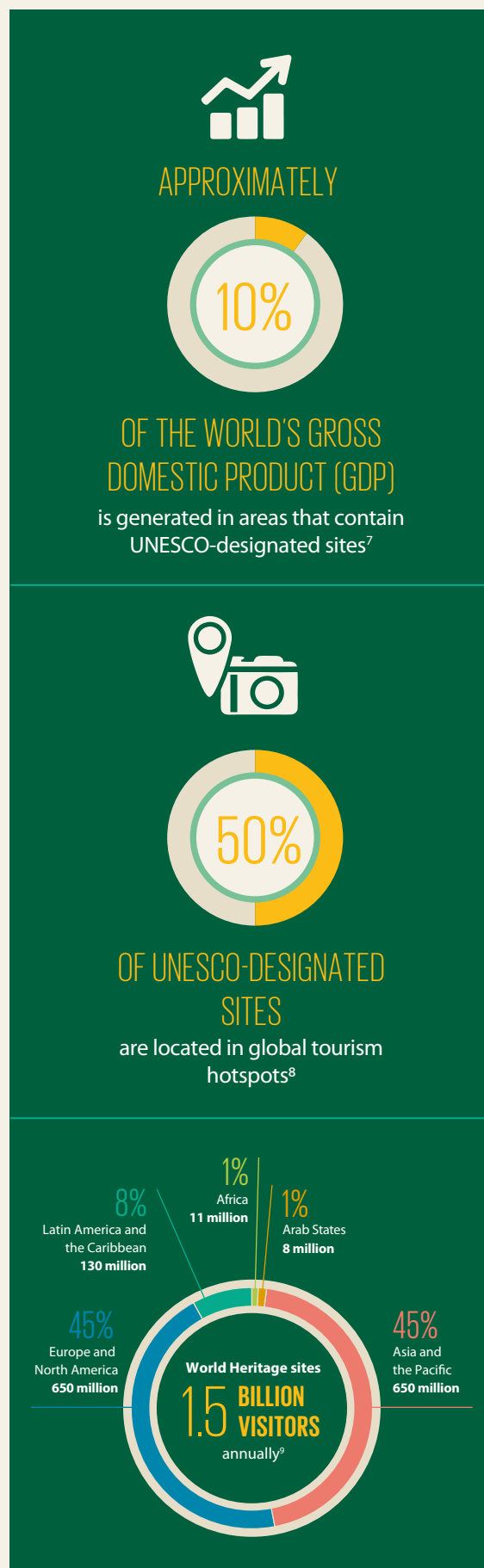
STRENGTHENING SUSTAINABLE LIVELIHOODS

Lake Malawi National Park (WH) is known for its crystal-clear waters and rock-dwelling cichlid fish. To protect its unique biodiversity, the Lake Malawi fish conservation project was launched in 2020 by UNESCO and the Malawian Government, with support from Norway and Ripple Africa. Community-led fisheries management through 34 local committees has reduced illegal fishing by over 50%, demonstrating that a healthy lake ecosystem is also more productive. Women play a key role, notably building 5,000+ fuel-efficient cookstoves, reducing deforestation and strengthening sustainable livelihoods.



5- Analysis based on data from Liu et al., 2024

6- Analysis based on data from World Atlas of Language Structures (WALS) (Available at: <https://wals.info>) and Native Land (Available at: <https://native-land.ca/>)

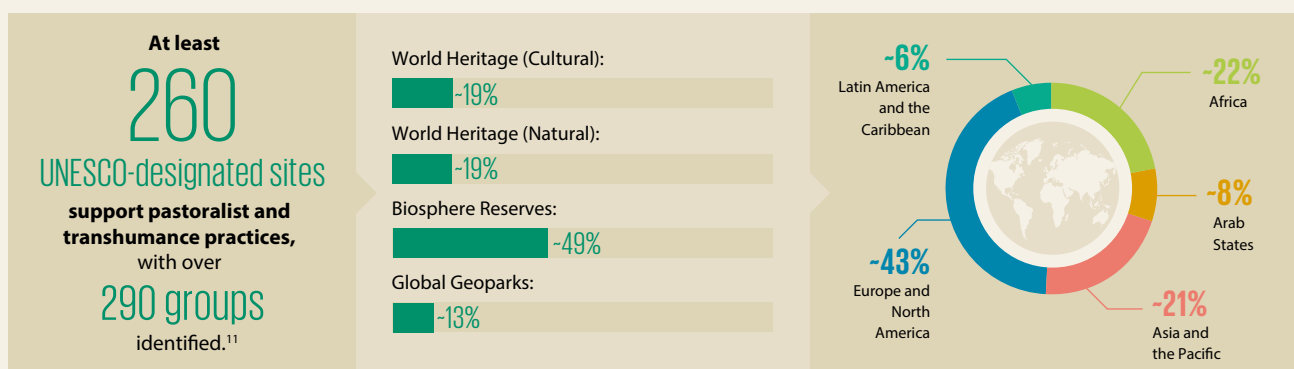
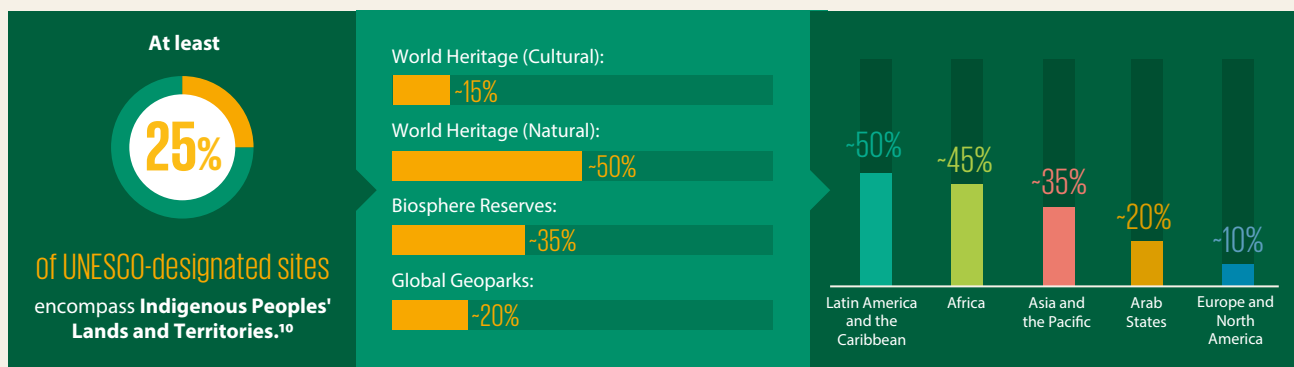


7- Analysis based on data from Kummur et al., 2025

8- Analysis based on data from Adamiak and Sayda, 2021

9- Analysis based on data from the World Heritage Convention's Periodic Reporting

INDIGENOUS KNOWLEDGE, ANCESTRAL PLACES



Guardians of the forest: the Baka and the living spirit of the Dja

For the Baka people of Cameroon, the forests of the **Dja (WH, BR)** are not simply a place to live but a living presence that teaches, nourishes and guides. Generations of hunters, gatherers and elders have learned its rhythms through observation, ritual and song. Knowledge of animals, plants and forest spirits shapes daily life and cultural identity. Forest journeys, storytelling and shared meals pass this knowledge to younger generations. Yet growing pressures from environmental change to restrictions on traditional livelihoods challenge this relationship. By continuing to listen to the forest and follow its teachings, the Baka sustain their traditions while helping protect the remarkable biodiversity of their ancestral homeland.



© UNESCO/Joan de la Malla



Tuareg nomadic pastoralists living in harmony with the desert in Air and Ténéré Natural Reserves

Across the wide horizons of the Sahara, Tuareg pastoralists travel with their herds through the landscapes of the **Aïr and Ténéré Natural Reserves (WH, BR)**. Their movements follow ancient routes shaped by seasons, grazing lands and hidden water sources known through long experience of the desert, though today this mobility is increasingly affected by regional insecurity, resource pressures and changing livelihoods. Mobility, cooperation and a careful use of scarce resources allow communities and herds to endure in an environment where survival depends on balance. Poetry, music and oral traditions carry memories of journeys across generations. In the shifting light of dunes and mountains, Tuareg life continues to unfold along paths traced by people and animals moving together through the desert.

© Nigel Crawhall

10- Analysis based on data from LandMark (Available at <https://landmarkmap.org>) and Garnett et al., 2018

11- Analysis based on data from the World map of pastoralists (Available at <https://www.pastoralpeoples.org/pastoralist-map/>)

Women's pottery sustaining identity and tradition in Tehuacán-Cuicatlán

In the **Tehuacán-Cuicatlán (WH, BR, GP)** Valley of Mexico, clay becomes the foundation of a living tradition. Ngiwá (Popoloca) women gather earth and minerals from the surrounding landscape and shape them into distinctive ceramic vessels using techniques refined over generations. The work requires patience, skill and deep familiarity with local materials. Mothers teach daughters not only how to form and fire the clay, but also the meanings and memories carried in each piece. Despite changing economic realities, the rhythmic work of shaping, polishing and firing pottery continues to bind families, cultural identity and the land together.



© CHAC*



Contemporary Ainu knowledge shaping community and landscape in Toya-Utsu

Rivers flowing from volcanic mountains and forests rich with wild plants shape the landscapes of **Toya-Utsu (GP)** in Japan. For the Ainu people, these places are shared with kamuy—spiritual beings present in animals, plants and natural forces. Fishing, gathering and preparing traditional foods express gratitude for the gifts of nature. Place names rooted in the Ainu language still map the land with stories of rivers, fish and mountains. Through ceremonies, community gatherings and everyday practices, Ainu families continue to nurture a way of life grounded in respect, reciprocity and belonging to the living landscape.

© UNESCO / Léa Lopez

Kujataa Greenland: Norse and Inuit farming at the edge of the ice cap

At the edge of Greenland's ice cap, the fields and pastures of **Kujataa (WH)** tell a story of life in the far north. Over centuries, Norse settlers and Inuit communities developed different ways of living from the same rugged environment. Norse farmers raised sheep and cattle on sheltered grasslands, while Inuit knowledge of sea ice, marine hunting and Arctic ecosystems shaped life along the coast. Together, these traditions reveal how people adapted to seasons of light and darkness, cold winds and fertile summer valleys. The landscape that remains today reflects this long history of resilience, exchange and human ingenuity in the Arctic.



© UNESCO / Aimée Bouchet



Indigenous knowledge, a legacy of environmental stewardship in East Rennell

On Rennell Island in the Solomon Islands lies Lake Tegano, a vast blue lagoon surrounded by forest and coral landscapes. The communities of **East Rennell (WH)** have long built their lives around these waters and lands. About 1,200 Polynesian inhabitants living in four villages garden, fish and hunt according to seasonal knowledge shaped by generations of experience. Their understanding of winds, plants and animals guides everyday decisions about food, travel and care for the island. East Rennell became the first natural World Heritage site recognized under customary ownership and management, reflecting a place where people and landscape continue to shape one another.

© UNESCO / Joan de la Malla

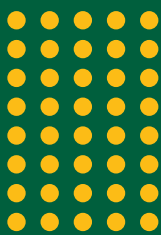
CROSSROADS OF LIVING HERITAGE

Living heritage—also known as intangible cultural heritage—includes the knowledge, practices and traditions that communities actively use and transmit from generation to generation. Unlike monuments or landscapes, living heritage is not physical, but it's deeply connected to people and reflected in their cultural practices. Recognised by the **UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage**¹², it encompasses five main domains:



The **Convention for the Safeguarding of the Intangible Cultural Heritage**, adopted in 2003, aims to safeguard the practices, expressions, knowledge and skills that communities, groups and, in some cases, individuals recognize as part of their cultural heritage and transmit from generation to generation. Today, 847 elements from 157 countries are inscribed on UNESCO's Intangible Cultural Heritage Lists.

Over **40%**



of Intangible
Heritage elements
are directly connected
to **nature***

1 ORAL TRADITIONS AND EXPRESSIONS

(including storytelling, languages, proverbs)



©National Museums of Kenya*



The **Traditions and practices associated with the Kayas in the sacred forests of the Mijikenda (Kenya)**, inscribed in 2009 on UNESCO's List of Intangible Cultural Heritage in Need of Urgent Safeguarding, are deeply woven into the spiritual and social life of the Mijikenda—nine Bantu-speaking communities living along Kenya's coast. Hidden within coastal forests, the Kayas began as fortified settlements and gradually evolved into sacred ritual spaces where elders gather, decisions are made, and ancestral spirits are honoured. Within these forest sanctuaries, oral traditions, governance systems, and ecological knowledge have been transmitted across generations. Today, these living traditions remain inseparable from the landscapes that sustain them, echoing through the **Sacred Mijikenda Kaya Forests (WH)** and the **Malindi–Watamu Arabuko Sokoke Biosphere Reserve (BR)**, where cultural identity, conservation, and biodiversity continue to reinforce one another.

2 PERFORMING ARTS

(including music, dance, theatre)



Quan họ Bắc Ninh folk songs, inscribed in 2009 on UNESCO's Representative List of the Intangible Cultural Heritage of Humanity, are alternating response songs performed by male and female singers from different villages at festivals and social gatherings in communal houses, at home, and on lakes and rivers. Practised by communities in Bắc Ninh and Bắc Giang provinces, where wet rice cultivation has long shaped local life, the songs are deeply tied to seasonal cycles and village traditions. The Quan họ villages are located in northern Viet Nam, a region that also includes UNESCO-designated sites such as the **Tràng An Landscape Complex (WH)** and the **Red River Delta (BR)**.

© Trong Nguyen / Shutterstock.com*



12- <https://ich.unesco.org/>

(*) Dive into intangible cultural heritage! Available at: <https://ich.unesco.org/en/dive>

3 SOCIAL PRACTICES, RITUALS AND FESTIVE EVENTS

(including ceremonies, festivals, celebrations)



© National Institute of Culture (Peru)*



The **Pilgrimage to the sanctuary of the Lord of Qoyllurit'i (Peru)**, inscribed in 2011 on UNESCO's Representative List of the Intangible Cultural Heritage of Humanity, unfolds high in the Andes where snow peaks and sacred traditions meet. Each year, thousands of pilgrims from Quechua communities journey toward the sanctuary near the Ausangate glacier, bringing with them vibrant ritual dances, music, and ceremonial offerings. Blending Indigenous cosmology with Catholic devotion, the pilgrimage celebrates mountain spirits and ancestral connections to the land. These gatherings take place along cultural landscapes historically connected by the vast Andean road network of **Qhapaq Ñan (WH)**, while nearby biosphere reserves safeguard fragile mountain ecosystems and **Imbabura (GP)** reveals the geological forces that shaped this remarkable cultural corridor.

4 TRADITIONAL CRAFTSMANSHIP

(including weaving, boatbuilding, pottery)



Traditional craft skills and arts of Al-Mudhif building (Iraq), inscribed in 2021 on UNESCO's Representative List of the Intangible Cultural Heritage of Humanity, reflect the ingenuity and communal spirit of the Marsh Arab communities of southern Iraq. For more than five millennia, master builders have shaped towering ceremonial guesthouses—known as Al-Mudhifs—entirely from reeds harvested from the surrounding wetlands. Constructed without nails or modern materials, these elegant structures rise from the marsh landscape as places of hospitality, community dialogue, and governance. The practice continues in the **Ahwar of Southern Iraq (WH)**, where life remains closely tied to the rhythms of the marshes, and it echoes architectural traditions dating back to ancient Mesopotamian centres such as **Babylon (WH)**, revealing a remarkable continuity between early civilizations and living cultural heritage.

Torsten Pursche / Shutterstock.com*



5 KNOWLEDGE AND PRACTICES CONCERNING NATURE AND THE UNIVERSE

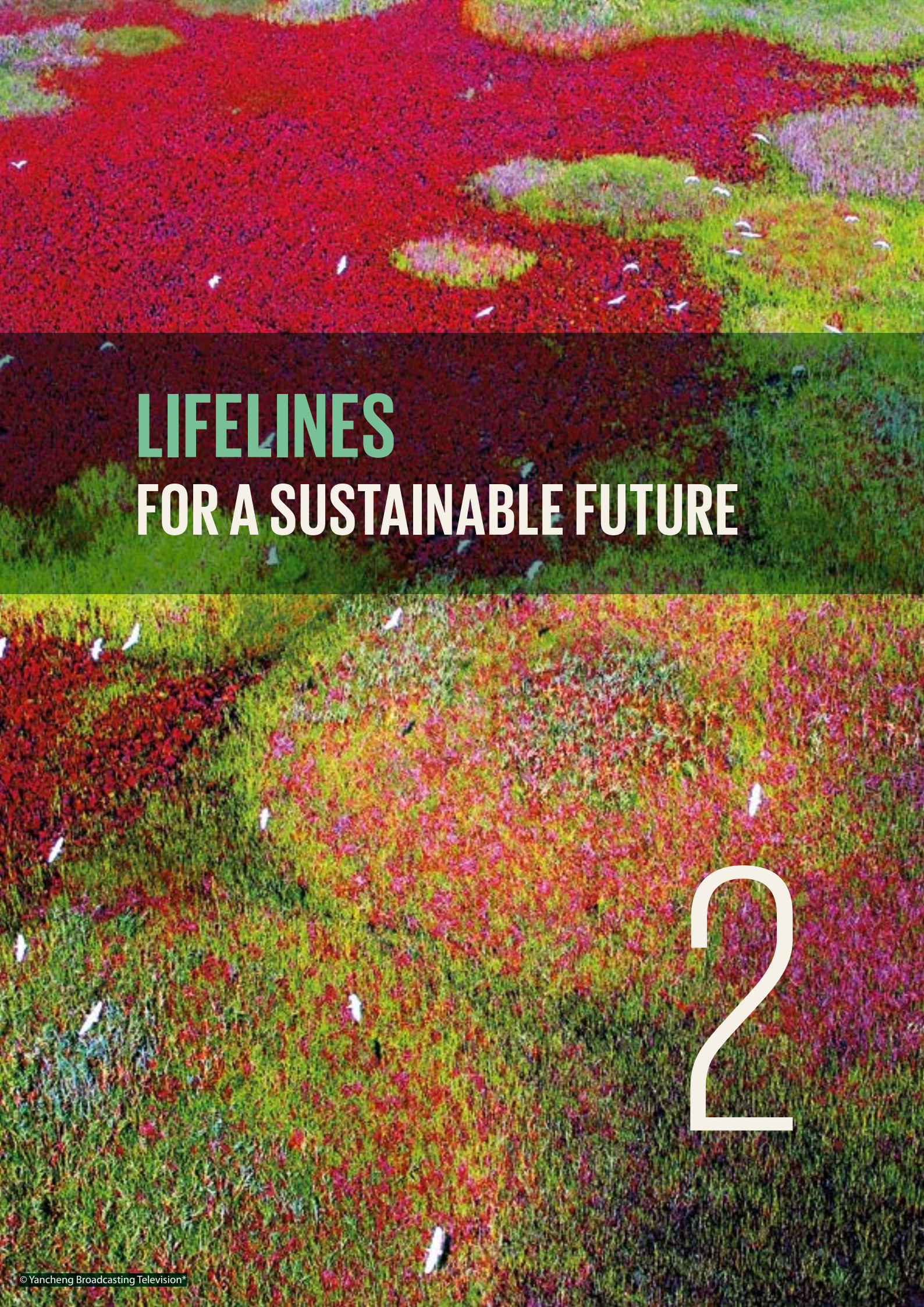
(including farming, healing, foodways, beliefs, cosmologies, ecological knowledge)



© Alfred Mikus*



Tree beekeeping culture (Belarus and Poland), inscribed in 2020 on UNESCO's Representative List of the Intangible Cultural Heritage of Humanity, preserves a centuries-old relationship between people, forests, and bees. Practitioners carefully carve hollows high in living trees to host wild bee colonies, tending them with techniques passed down through generations of forest guardians. The practice demands deep ecological knowledge, craftsmanship, and respect for the rhythms of woodland ecosystems. It continues today in the ancient landscape of **the Białowieża Forest (WH, BR)**, one of Europe's last primeval forests, where traditional beekeeping stands as a powerful example of how cultural knowledge can support biodiversity and sustainable forest stewardship.



LIFELINES **FOR A SUSTAINABLE FUTURE**

2

WHY NATURE MATTERS

Nature is the foundation of life on Earth. It includes not only living organisms, but also landscapes, water, soils, climate systems and the natural processes that sustain the planet. Human societies, cultures and economies depend on and are shaped by their relationship with nature.

NATURE SUSTAINS LIFE AND WELLBEING

Nature is at the basis of agricultural and food systems. It provides food, freshwater, energy and raw materials, and supports physical and mental health. Yet, the amount we spend on biodiversity conservation to sustain Nature's Contributions to People is insignificant (less than 0.25 per cent of the GDP).¹³



© Aslancreation / Shutterstock.com*

In Morocco's **Arganeraie Biosphere Reserve (BR)**, agroforestry systems provide food and argan oil while supporting grazing, livelihoods and traditional practices for local communities.

NATURE SUPPORTS ECONOMIES AND LIVELIHOODS

Over half of the world's economy is dependent on nature and its services and nature positive initiatives could generate up to \$10 trillion in economic value and support about 395 million jobs by 2030.¹⁴



© NASA

Visible from space, Australia's **Great Barrier Reef (WH)** is the world's largest coral reef system. In addition to its spiritual significance and traditional use, the reef is valued at \$56 billion as an economic, social and iconic asset.¹⁵

NATURE AND CULTURE ARE INTERCONNECTED

Nature has long nourished knowledge systems, inspired creativity, and influenced linguistic diversity, as well as cultural heritage and practices. It is central to many religions, with over 230 animal species serving as national symbols in more than 140 countries.¹⁶



© Ola Jennersten

In the **Laponian Area (WH)** and **Vindelälven-Juhtadahka (BR)** of northern Sweden, the Saami peoples—indigenous to the Arctic—sustain traditional reindeer herding practices grounded in a deep understanding of Arctic ecosystems.

NATURE REGULATES THE EARTH'S LIFE-SUPPORT SYSTEMS

Nature maintains habitats that sustain biodiversity, food webs, and pollination. Healthy ecosystems also limit zoonotic disease emergence, as around 60% of infectious diseases are zoonotic and often linked to environmental degradation.¹⁷



© Jess Kraft / Shutterstock.com*

The wetlands of the **Senegal River Delta Area (WH, BR)** in Senegal and Mauritania sustain migratory birds. As these birds can carry and spread diseases like avian influenza along flyways, healthy wetlands help limit transmission.

NATURE IS KEY TO CLIMATE RESILIENCE

Natural ecosystems (oceans and land) absorb about 56% of anthropogenic greenhouse gas (GHG) emissions on average, helping slow climate change while buffering impacts such as extreme heat, droughts, and floods, and strengthening overall climate resilience.¹⁸



© Ondrej Prosicky / Shutterstock.com*

Forests in **Brazil's Central Amazon (WH, BR)**, which contains some the planet's highest biodiversity, stock and absorb large quantities of carbon from the atmosphere through their living biomass.

HEALTHY NATURE REDUCES DISASTER RISKS

Nature-based solutions reduce disaster risk by strengthening ecosystem resilience and protecting communities from hazards, preventing up to \$3.7 trillion in damages.¹⁹ For instance, mangroves reduce coastal flooding impacts and storm surge exposure.



© raditya / Shutterstock.com*

The volcanic landscapes and forested watersheds of **Rinjani-Lombok (BR, GP)** in Indonesia help reduce disaster risks by stabilizing soils and reducing floods and landslides, protecting downstream communities and supporting agriculture and water supplies.

13- IPBES, 2024.

14- World Economic Forum, 2020

15- Deloitte, 2017

16- Hammerschlag and Gallagher, 2017

17- UNEP and ILRI, 2020

18- IPCC, 2023

19- UNDP, 2024

TESTIMONIES OF EARTH'S HISTORY



FOSSILS ARE TESTIMONIES of the record of life on Earth,

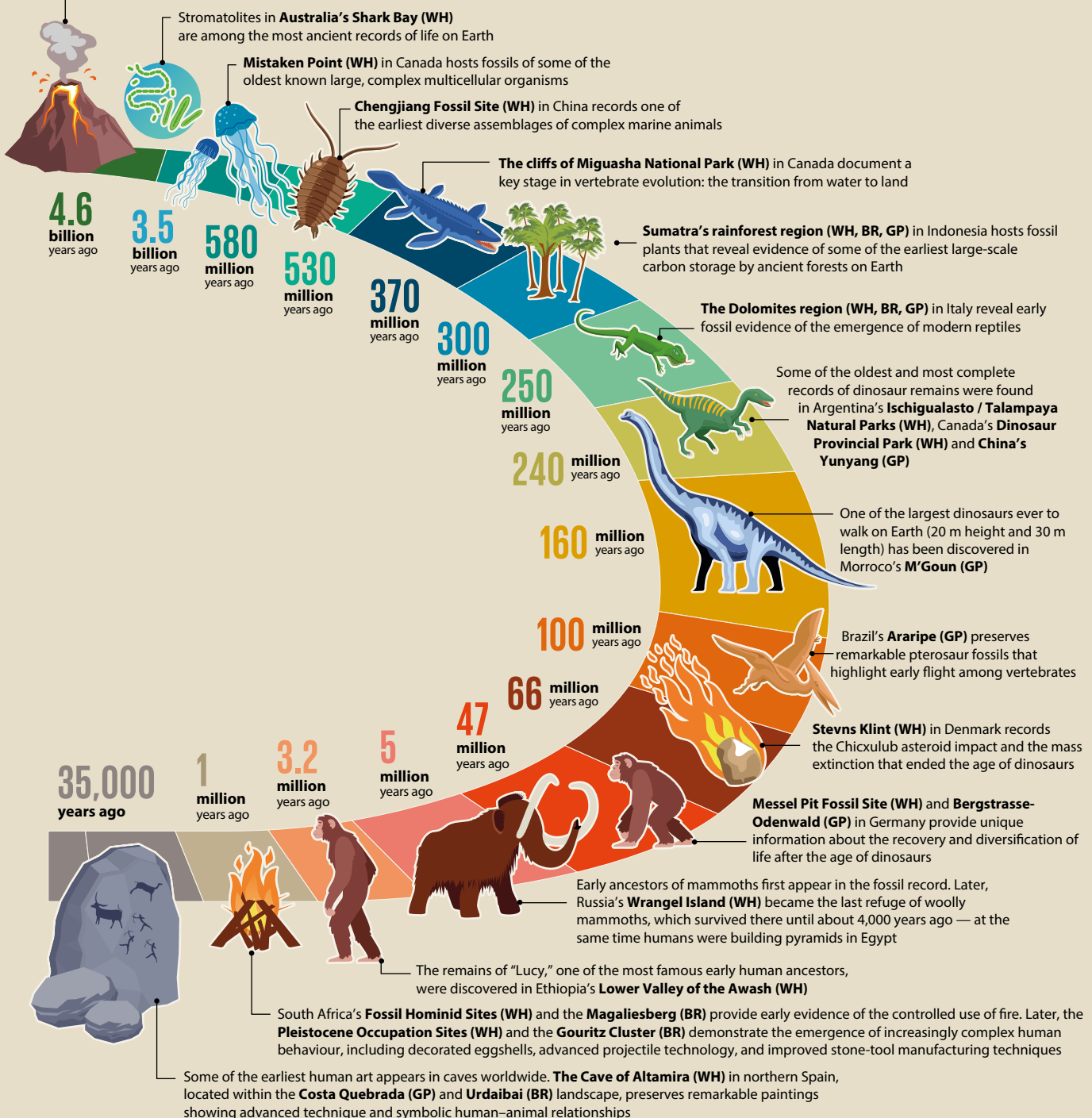
and together with the diversity of our present-day species and ecosystems provide important evidence of biological evolution over time

More than

30,000 FOSSIL SPECIES

have been identified in UNESCO-designated sites, representing around 10% of all described to date²⁰

FORMATION OF EARTH

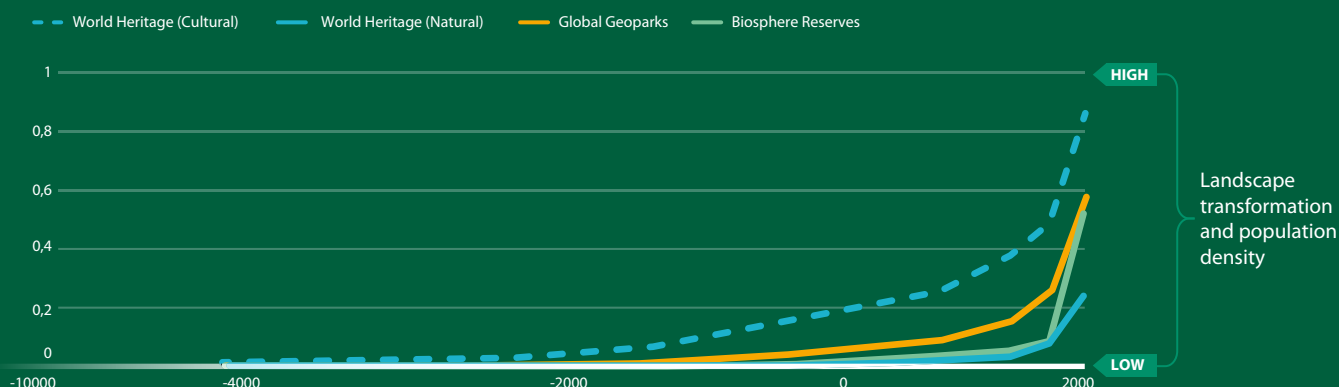


20- Analysis based on data from the Paleobiology Database (Available at: <https://paleobiodb.org/>)

ADAPTING TO ENVIRONMENT, SHAPING LANDSCAPES

Landscapes around UNESCO-designated sites have been shaped by human activity for centuries or millennia.²¹

Evolution of human-nature relationships in UNESCO-designated sites (Anthromes*)



HUMAN-NATURE RELATIONSHIPS

Araucarias (BR) and Kütralkura (GP) in Chile are home to more than 120,000 people and vast forests of monkey-puzzle trees (*Araucaria araucana*), a species central to Chile's national identity.

For centuries, the *Pehuenches* have maintained an ancestral and intricate relationship with araucarias, which are fundamental to their culture, rituals, and ceremonies, and whose distribution historically aligns with their territory.

"Tall on earth
they placed you,
sturdy, beautiful
monkey-puzzle tree
of the southern mountains,
tower of Chile,
tip of the green territory,
pavilion of winter,
vessel of fragrance."

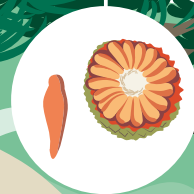
"Long ago,
long ago it was
when for the Indigenous
People
you unfurled
like a wooden rose,
the colossal offering
of your fist,
scattering
on the wet earth
the pine nuts:
flour, wild bread
of the indomitable
Arauco..."

PABLO NERUDA –

*Ode to the Araucaria
Araucana*



Distribution of
araucaria trees
historically
**follows the
limits of
Pehuenche
territory.**



The *piñón* (araucaria seed) is part of the *Pehuenches'* **diet** and was used for **trade**.



Guanacos rely on *piñón*. **They eat and disperse** the seeds.

Araucarias are centre to *Pehuenches'* culture, rituals and ceremonies.

Their thick bark gives *araucarias* **fire-resistant properties**, insulating them from heat.



Today, more frequent droughts due to climate change may increase fire risks and **hinder araucarias' capacity to resist fire**.

21- Analysis based on data from Ellis et al. 2021

(*) Anthromes are a scientific classification used to describe how humans have shaped ecosystems over time from minimally impacted areas to intensively used landscapes.

NATURE AS A DRIVER OF HUMAN INGENUITY

Cultural World Heritage sites highlight how human societies developed in close response to their natural surroundings. Cities, infrastructures, and landscapes were shaped by deserts, rivers, land formations, climate, and natural resources. From adaptive water systems and climate-responsive architecture to canals and industrial landscapes powered by nature, environmental conditions guided human creativity.



6,000 years ago

At **Budj Bim (WH)** in Australia, the Gunditjmarra people developed one of the world's oldest known aquaculture systems. By modifying wetlands with channels, weirs, and dams, they sustainably managed water flows to trap and harvest eels, demonstrating a deep understanding of ecological processes.



3,500 years ago

In **Ancient Thebes (WH)**, Egyptian civilizations developed in close relationship with the Nile, using its predictable flooding cycles to sustain agriculture. Irrigation systems and basin cultivation enabled the management of water in an arid environment, supporting one of the world's earliest large-scale civilizations.



2,500 years ago

The **Grand Canal (WH)**, stretching across eastern China, reflects the enduring relationship between humans and nature. Linking major river systems through sophisticated hydraulic engineering, it has supported economic exchange, cultural interaction, and regional integration since 500 BC.



2,000 years ago

The **Cultural Sites of Al Ain (WH)** in the United Arab Emirates adapted to an arid desert environment through the aflaj irrigation system, which channels groundwater from underground sources to oasis settlements and fields. More than 2,000 years old, it represents one of the oldest continuously used water-management traditions in the region.



5th century

In the **Konso Cultural Landscape (WH)** of Ethiopia, communities have shaped terraced hillsides to support agriculture in a dry environment. Stone terraces, water conservation practices, and agroforestry systems demonstrate long-term adaptation to soil erosion and water scarcity.



12th century

At **Mesa Verde National Park (WH)** in the United States of America, ancestral Pueblo communities adapted to hot and arid conditions through climate-responsive design. Dwellings built under south-facing cliff overhangs, using local materials and solar orientation, reduced heat exposure in summer while retaining warmth in winter.



18th century

Derwent Valley Mills (WH) in the United Kingdom illustrates the close link between industry and nature during the Industrial Revolution, where water-powered cotton mills transformed the landscape and shaped the development of some of the world's earliest factory communities.

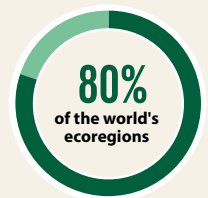
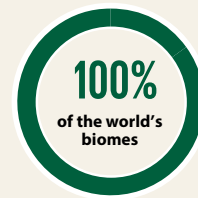


21st century

The **Singapore Botanic Gardens (WH)** are closely integrated into Singapore's dense urban environment, reflecting the nation's vision of a 'city in a garden,' where human-designed landscapes and biodiversity coexist.

STRONGHOLDS OF NATURE

UNESCO-DESIGNATED SITES: A GLOBAL SNAPSHOT OF EARTH'S NATURAL ENVIRONMENTS:²²



are represented within UNESCO-designated sites

BIOME COMPOSITION

36%
Forests



33%
Coastal and marine
ecosystems



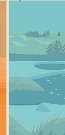
13%
Grasslands &
Savannas



10%
Deserts &
drylands



5%
Tundra &
Permafrost

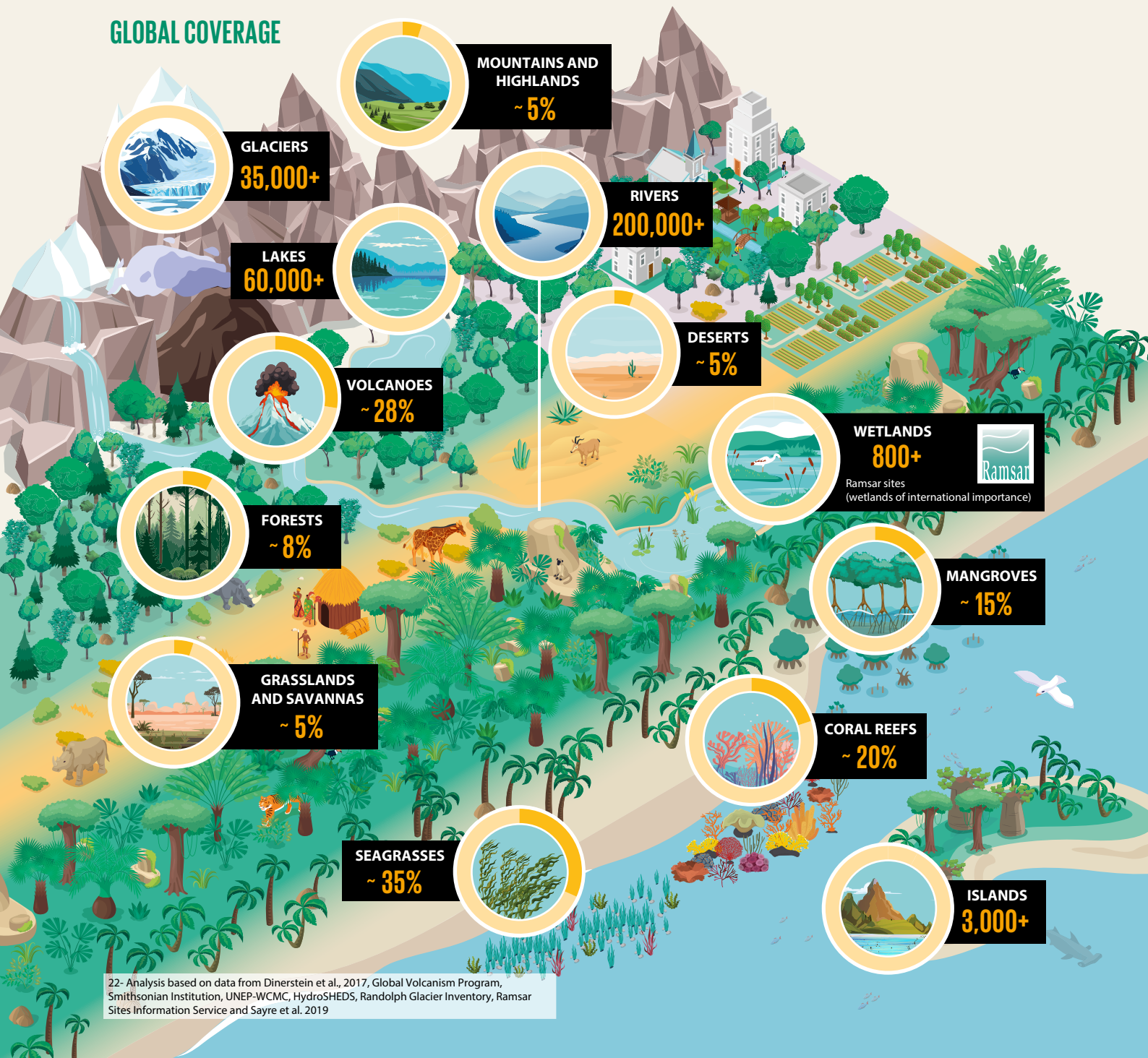


1%
Inland
waters



2%
Mountains &
Highlands

GLOBAL COVERAGE



²²- Analysis based on data from Dinerstein et al., 2017, Global Volcanism Program, Smithsonian Institution, UNEP-WCMC, HydroSHEDS, Randolph Glacier Inventory, Ramsar Sites Information Service and Sayre et al. 2019

REGULATING THE GLOBAL CLIMATE

CRITICAL CARBON SINKS



Forests within UNESCO-designated sites alone account for about

15% OF ALL THE CO₂ ABSORBED (NET) BY FORESTS WORLDWIDE²³

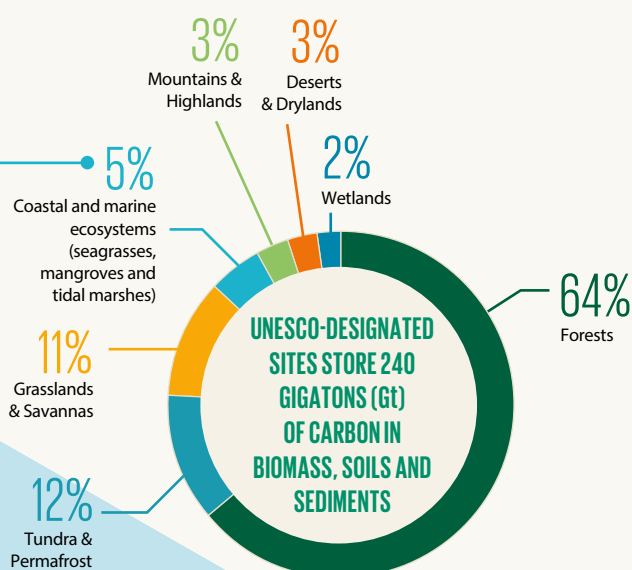
CARBON STORAGE IN SOILS AND SEDIMENTS

240 Gt C²⁴



Coastal marine ecosystems within UNESCO-designated sites alone account for about

1/3 OF ALL THE WORLD'S BLUE CARBON STOCK



EQUIVALENT TO MORE THAN TWO DECADES OF TODAY'S FOSSIL-FUEL CO₂ EMISSIONS IF RELEASED INTO THE ATMOSPHERE



GREENLAND ICEBERGS
10%

²³ Analysis done based on data from Global Forest Watch (GFW)

²⁴ Analysis done based on data from Krause et al. 2024 for seagrasses and Soto-Navarro et al. 2020 for other biomes

AN OUTSTANDING BIODIVERSITY

KEY BIODIVERSITY AREAS (KBAs)

(Areas of international importance for biodiversity conservation)

3 million km²

—an area equivalent to India—across 1,300+ UNESCO-designated sites.²⁶

3,600+

KBAs identified in UNESCO-designated sites

approximately

1/5

of the global total

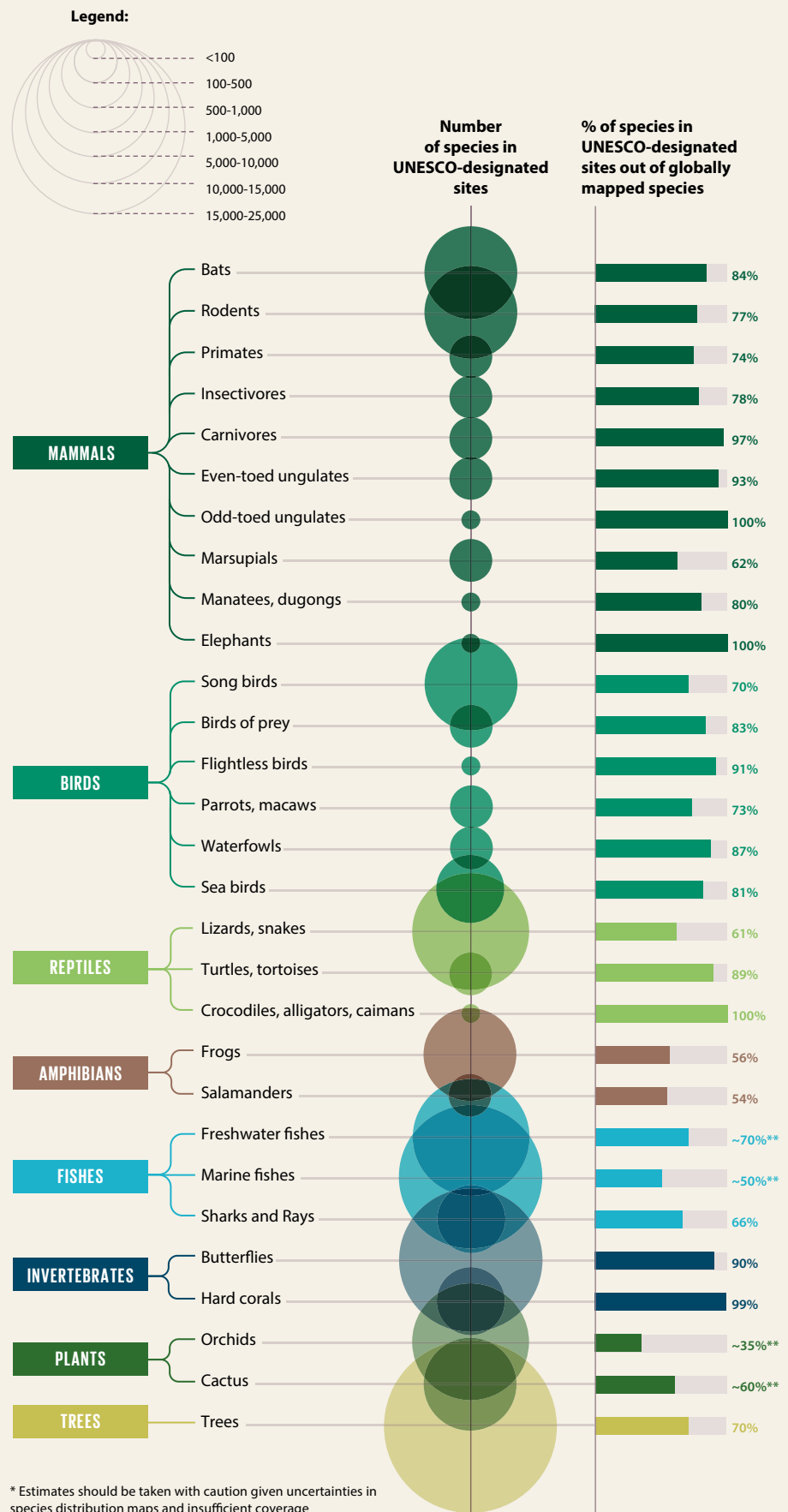
MAPPING MARINE BIODIVERSITY

The UNESCO eDNA expeditions, supported by Flanders, Monaco and the Minderoo Foundation, use citizen science to map marine biodiversity across more than 20 UNESCO-designated sites. In just one sampling campaign at each site, 10–20% of expected marine species were detected, a result that would require far greater effort using traditional methods.

© Cheikh Fall



OVER 60% OF ALL GLOBALLY MAPPED SPECIES²⁵—40% ENDEMIC*

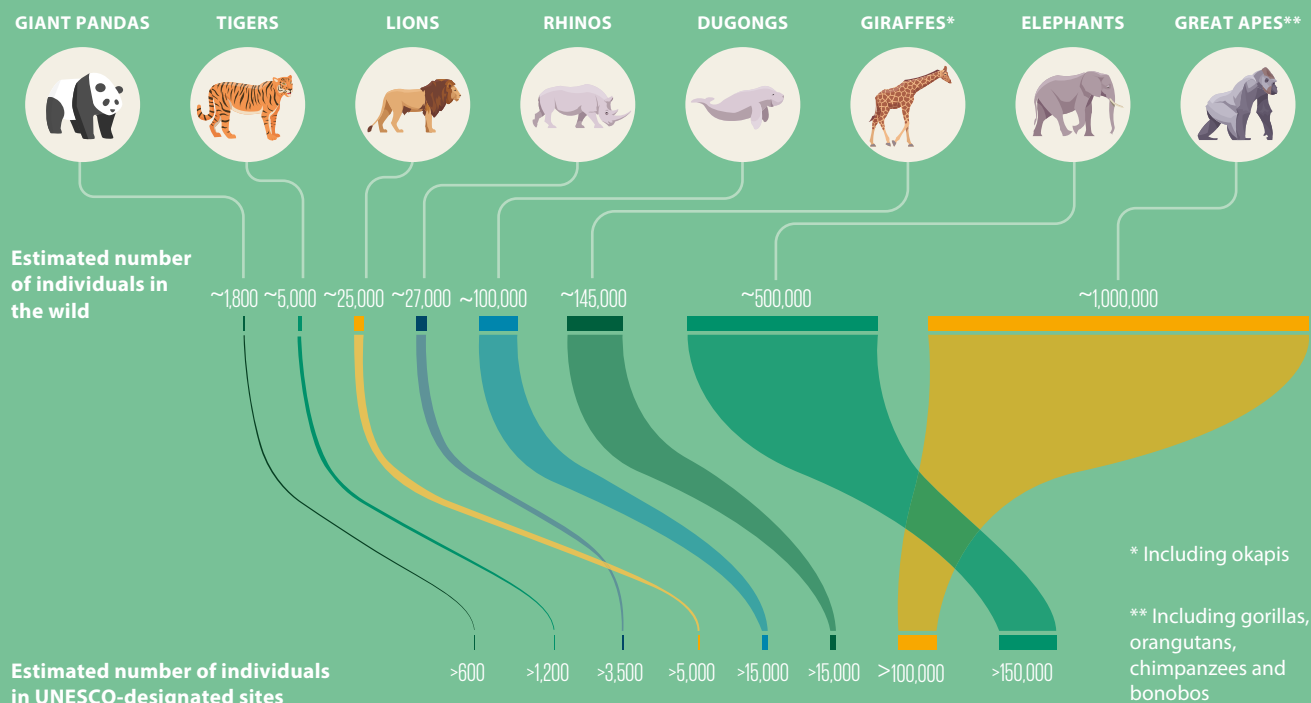


25- Analysis done based on data from Ocean Biodiversity Information System (OBIS) for marine fishes, sharks and rays, and hard corals, Global Biodiversity Information Facility (GBIF) for orchids and cactus, and Map of Life (mol.org) for all other species

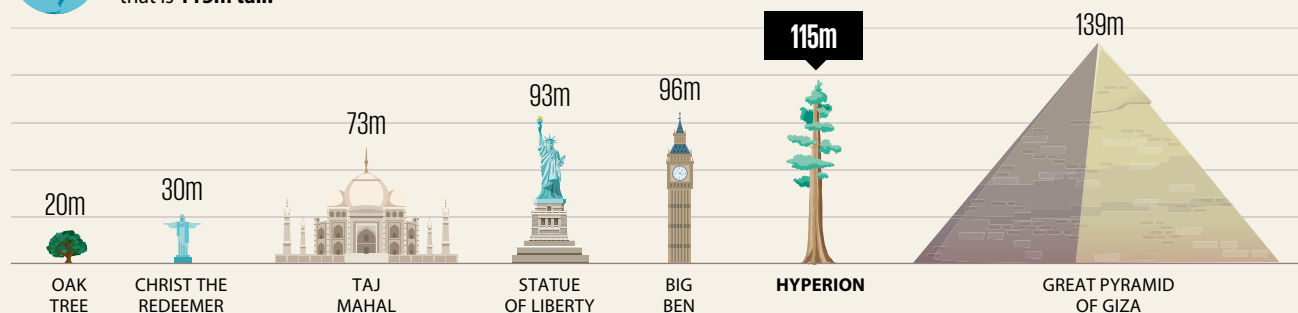
26- Analysis done based on data from the World Database of Key Biodiversity Areas

A HAVEN FOR ICONIC FAUNA AND FLORA

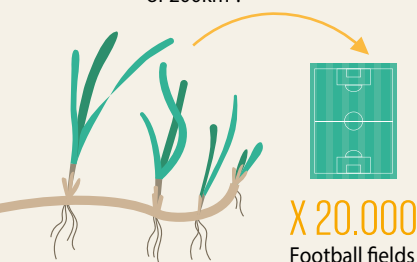
UNESCO-designated sites support up to 1/3 of the last remaining elephants, tigers and pandas, and at least 1 in 10 great apes, giraffes, lions, rhinos and dugongs.



Redwood National and State Parks (WH) in the United States of America is home to the tallest tree on Earth: Hyperion, a coastal redwood that is **115m tall**.



Shark Bay (WH) in Australia is home to the largest seagrass plant on Earth stretching over 180km and covering an area of 200km².



Tropical Rainforest Heritage of Sumatra (WH) and Gunung Leuser (BR) in Indonesia contains populations of the world's largest (*Rafflesia arnoldi*) and tallest flowers (*Amorphophallus titanum*).



Los Alerces National Park (WH) in Argentina is home to "Abuelo", one of the oldest trees on Earth approximately **2,600 years old**.



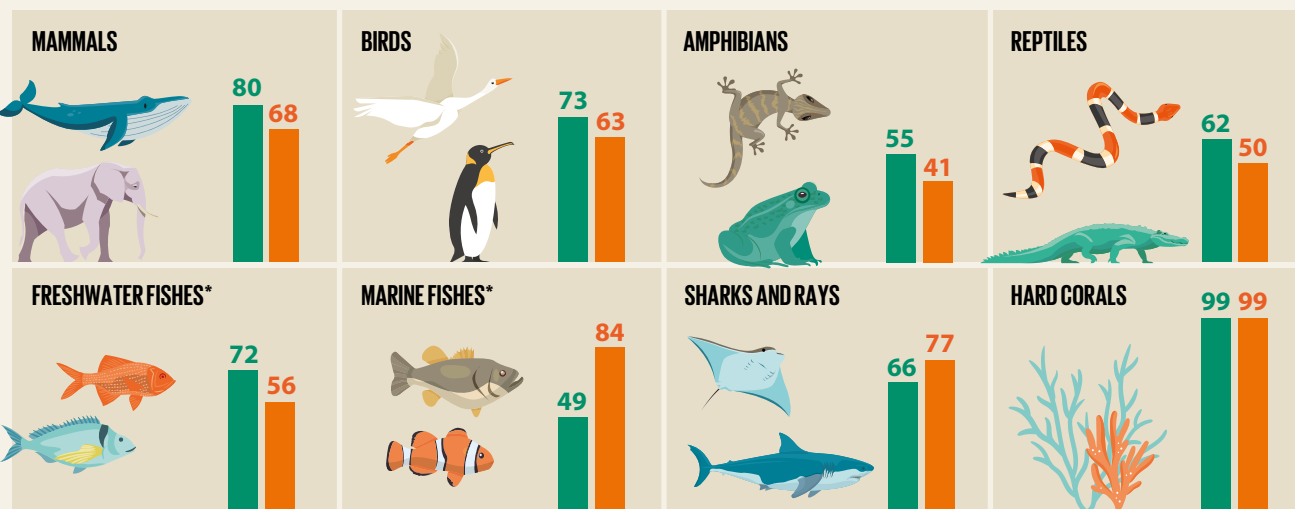
South Africa's Cape Floral region, the mountains of Yunnan in China, and Talamancas/La Amistad in Costa Rica and Panama (WH, BR) have the highest concentration of plant life on the planet with more than **5,000 different species each**.



CRITICAL PLACES TO PROTECT GLOBALLY THREATENED SPECIES

● % of globally mapped species found in UNESCO-designated sites

● % of globally threatened species found in UNESCO-designated sites²⁷

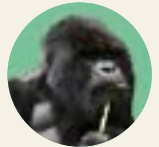
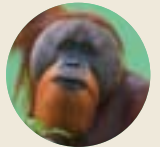


1/2 OF ANIMAL SPECIES

1/3 OF PLANT SPECIES



protected under the **Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)** can be found in UNESCO-designated sites²⁸

	VAQUITA	JAVAN RHINO	PINK IGUANA	MOUNTAIN GORILLA	SUMATRAN ORANGUTAN	GIANT TORTOISE
	(World's smallest cetacean)	(Asian one-horned rhinoceros)	(One of the most important biological discoveries of the century)	(One of the world's largest living primates)	(One of the world's largest arboreal mammals)	(World's largest terrestrial turtles)
						
Estimated number of individuals in the wild	~10	~60	~200	~1,000	~15,000	~120,000
Percentage in UNESCO-designated sites	100%	100%	100%	>90%	>85%	100%

PROTECTING MOUNTAIN GORILLA

Virunga National Park (WH) in the Democratic Republic of the Congo (DRC), home to one-third of the world's mountain gorillas, has strengthened protection efforts despite ongoing unrest through support from UNESCO, with funding from Norway. Working with the Virunga Foundation and the Institut Congolais pour la Conservation de la Nature (ICCN), a community-driven gorilla monitoring programme is deploying and training 50 community trackers to conduct daily patrols, monitor gorilla health, and remove snares. These efforts are sustaining conservation gains, with mountain gorillas showing a 5% annual population growth over the past decade while preventing poaching and ensuring continued protection.



© Kristof Eyckmans / Shutterstock.com*

27- Analysis done based on data from Map of Life and IUCN Red List of Threatened Species

28- Analysis done based on data from UNEP Species+. Available at <https://www.speciesplus.net/>

VITAL STEPPING STONES FOR MIGRATORY SPECIES

MANY UNESCO-DESIGNATED SITES ARE VITAL STOPOVERS WHERE MIGRATORY SPECIES BREED, FEED, AND REST.

They support movement along bird “flyways,” marine “swimways,” and terrestrial routes—making them essential for wildlife across land, sea, and air.



>2/3 OF SPECIES

protected under the Convention on the Conservation of Migratory Species of Wild Animals (CMS) can be found in UNESCO-designated sites²⁹



MONARCH BUTTERFLY MIGRATION

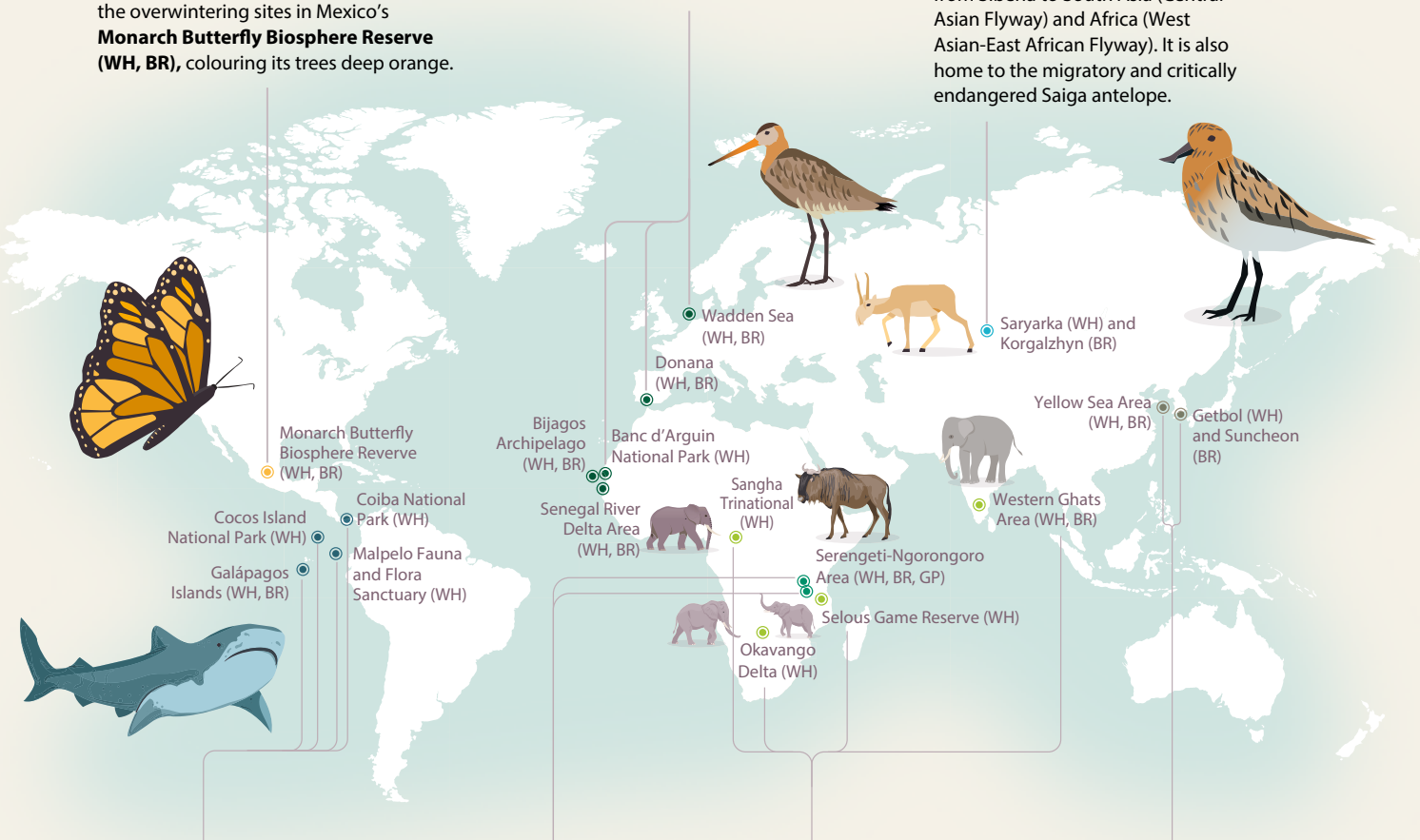
The annual migration of the Eastern monarch butterfly is the longest migration trajectory of any insect. Up to a billion monarch butterflies return annually from breeding areas as far away as Canada to the overwintering sites in Mexico's **Monarch Butterfly Biosphere Reserve (WH, BR)**, colouring its trees deep orange.

EAST ATLANTIC FLYWAY

The East Atlantic Flyway is a key migration route used by about 90 million birds annually. **UNESCO-designated sites** are key stop-over sites along the flyway, connecting European and African sites.

WEST ASIAN-EAST AFRICAN AND CENTRAL ASIAN FLYWAYS

Saryarka (WH) and **Korgalzhyn (BR)** in Kazakhstan are at the cross roads of important flyways of migrating birds from Siberia to South Asia (Central Asian Flyway) and Africa (West Asian-East African Flyway). It is also home to the migratory and critically endangered Saiga antelope.



EASTERN TROPICAL PACIFIC MARINE SWIMWAY

UNESCO-designated sites constitute a unique interconnected 'swimway' in the eastern tropical Pacific Ocean where endangered marine species such as sharks, sea turtles, and whales migrate between the sites.

THE GREAT MIGRATION

The Great Migration of wildebeest across the plains of East Africa is one of our planet's last intact animal migrations. Every year, over a million animals cross the **Serengeti-Ngorongoro Area (WH, BR, GP)** in what is known as 'one of the greatest wildlife spectacles on Earth'.

ELEPHANT MIGRATION

The **Okavango Delta (Botswana)**, **Sangha Trinational (Cameroon, Central African Republic, Congo)**, **Selous Game Reserve (United Republic of Tanzania)** and **Western Ghats (India)** are central nodes of elephant migration routes.

EAST ASIAN-AUSTRALASIAN FLYWAY

UNESCO-designated sites in the Yellow Sea Area are central to the East Asian Australasian Flyway, which is the most threatened flyway in the world.

The designations employed and the presentation of material on this map are for visualization only and do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.
Source: United Nations / Geospatial Information Section of the United Nations.

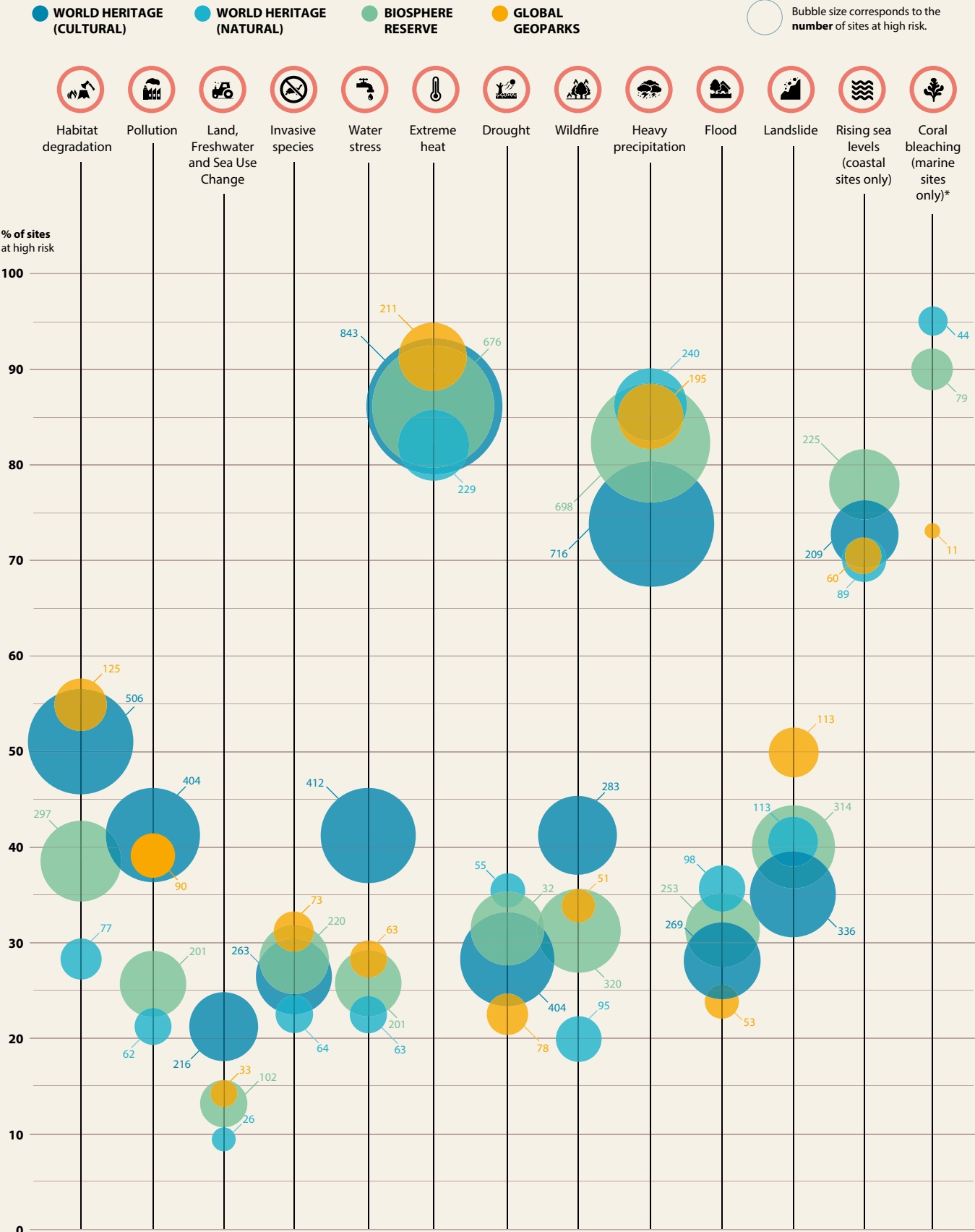
RESILIENT SITES UNDER INTENSIFYING PRESSURES



3

LANDSCAPES AT RISK

NEARLY 90% OF UNESCO-DESIGNATED SITES are at high level of environmental stress³⁰.



* Data for cultural World Heritage sites not available

30- Analysis done based on data from World Resources Institute (WRI) Aqueduct Water Risk Atlas for water stress, drought and flood, Mellin et al. 2024 for coral bleaching, HIST, 2025 for extreme heat and heavy precipitation, Copernicus Marine Service for rising sea levels, and WWF Biodiversity Risk Filter for all other indicators.

EVOLVING PRESSURES, INCREASING RISKS

HUMAN PRESSURES IN UNESCO-DESIGNATED SITES have historically been driven mainly by land-use changes linked to agriculture, logging, and infrastructure development, including roads.

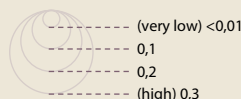
Invasive species are found in more than **80% of UNESCO-designated sites**³¹



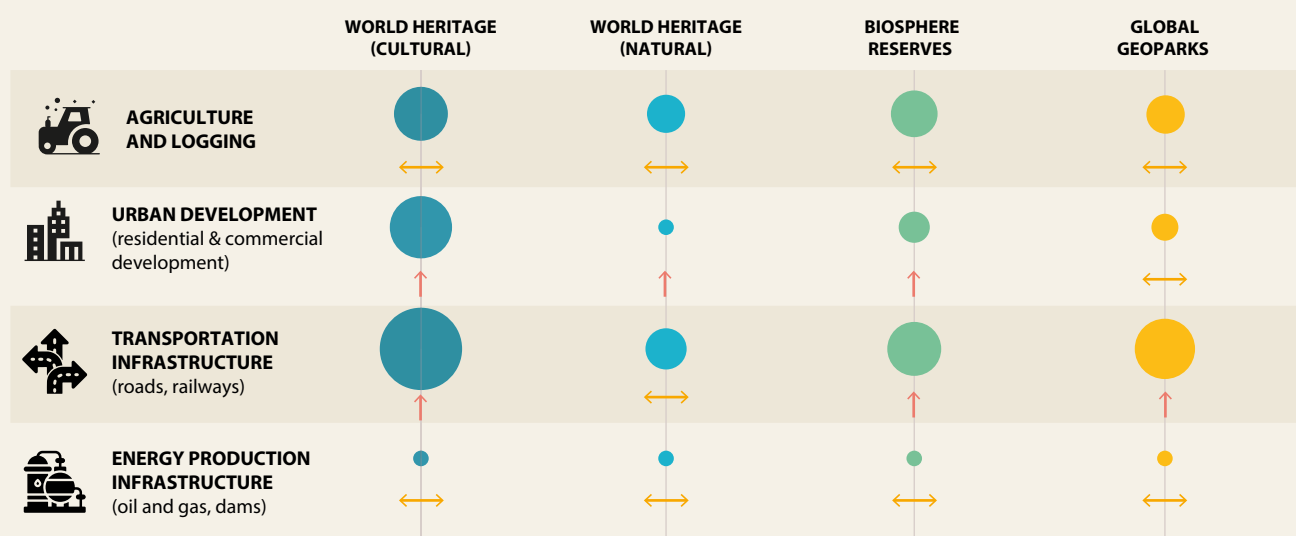
CHANGES IN HUMAN PRESSURES IN UNESCO-DESIGNATED SITES SINCE 2000

LEGEND:

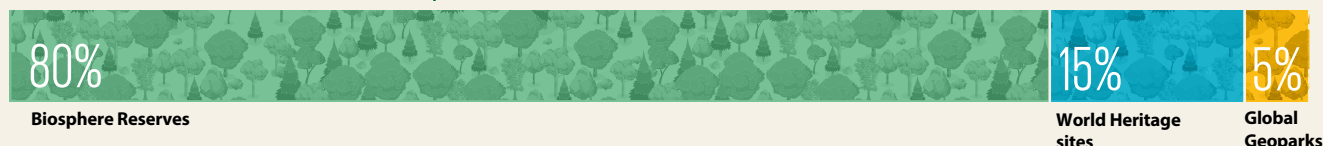
Human Modification Index:³²



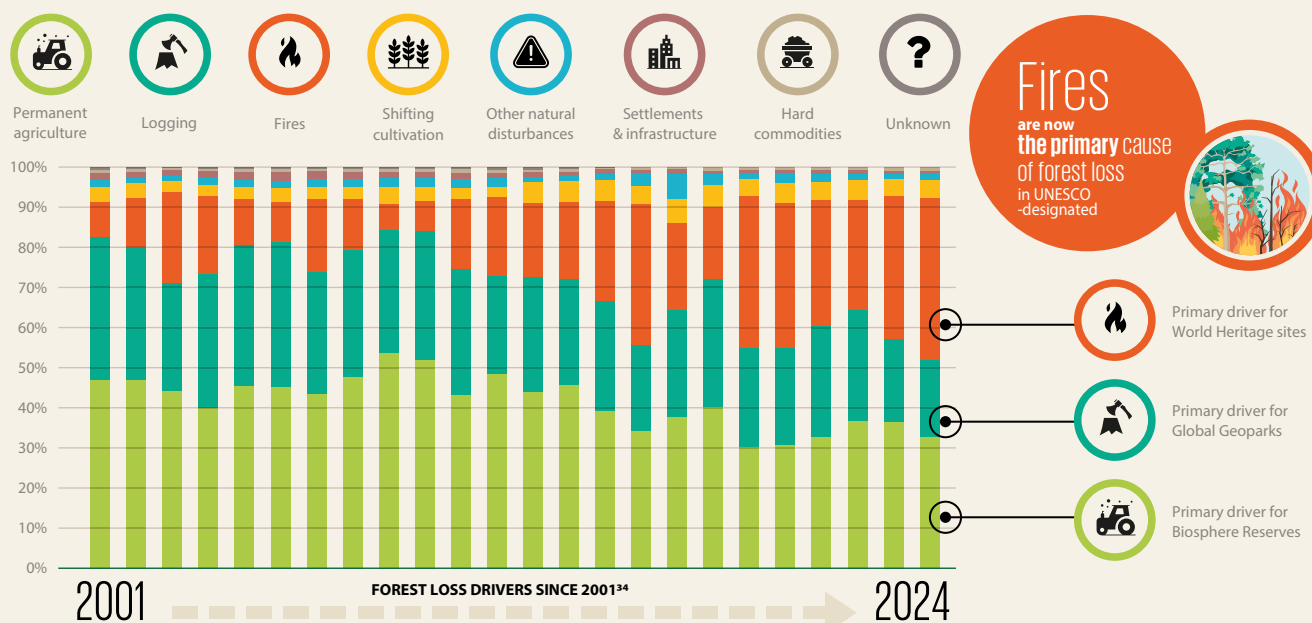
Trend: stable increasing



>300,000 km² OF TREE COVER LOSS since 2001³³



THE NATURE OF THESE PRESSURES IS EVOLVING, CREATING NEW RISKS AND REQUIRING DIFFERENT MANAGEMENT RESPONSES



31- Analysis based on data from Marino et al. 2024

32- Analysis based on data from Theobald et al. 2025

33- Analysis done based on data from Global Forest Watch (GFW)

34- Analysis done based on data from Global Forest Watch (GFW)

RESILIENCE IN A CHANGING WORLD

OVER THE 20TH CENTURY, HABITAT CONDITIONS have degraded globally and across the landscapes surrounding UNESCO-designated sites.



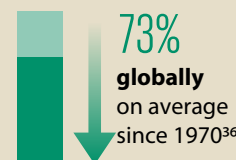
2x

However, degradation within sites over the past century has been two times less severe than in surrounding landscapes³⁵



Over the past ~50 years, monitored wildlife populations within UNESCO-designated sites have been better protected compared to global trends

MONITORED WILDLIFE POPULATIONS



Stable on average in UNESCO-designated sites³⁷

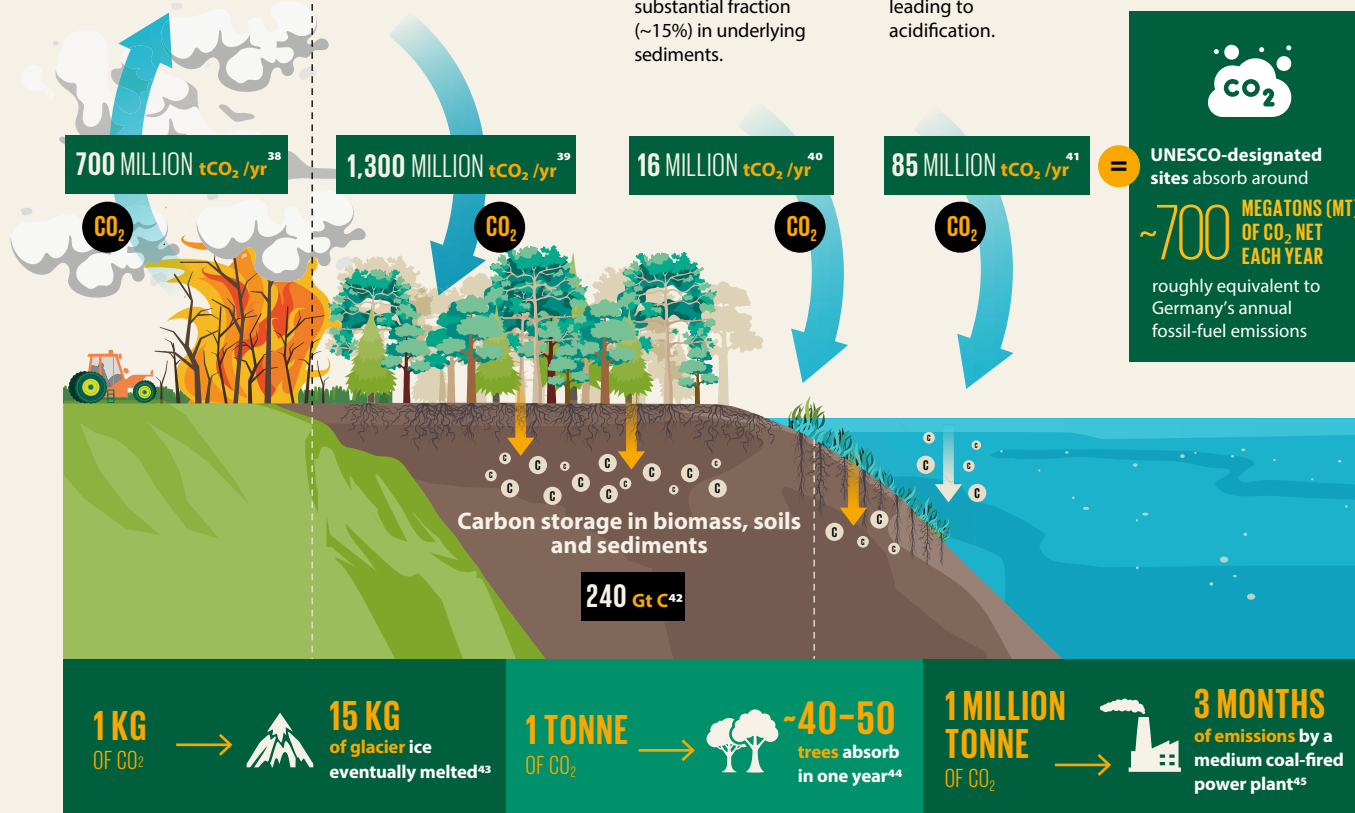
CARBON CYCLE IN UNESCO-DESIGNATED SITES

LAND-USE CHANGE AND DISTURBANCES (e.g. deforestation, fires, agriculture, urbanization) release carbon stored in biomass and soils and reduce the capacity of ecosystems to absorb CO₂.

TERRESTRIAL VEGETATION (primarily forests, but also grasslands and other ecosystems) absorbs CO₂, which is then stored as carbon in biomass and soils, forming major terrestrial carbon sinks.

COASTAL ECOSYSTEMS (dominated in extent by seagrasses, alongside mangroves and marshes) absorb CO₂ and store it as carbon ("blue carbon"), with seagrasses burying a substantial fraction (~15%) in underlying sediments.

THE OCEAN absorbs large amounts of CO₂ from the atmosphere, acting as a major carbon sink. The absorbed CO₂ dissolves in seawater, lowering pH and leading to acidification.



35- Analysis done based on data from Pereira et al. 2024

36- Analysis done based on data from the Living Planet Index (LPI). This is a diversity-weighted trend based on 34,836 populations of 5,495 species

37- Analysis done based on data from the Living Planet Index (LPI). This is an unweighted trend based on 1089 species and 2958 populations from

38- Analysis done based on data from Global Forest Watch (GFW)

39- Analysis done based on data from Global Forest Watch (GFW)

40- Analysis done based on data from Gomis et al. 2025

41- Analysis done based on data from Copernicus Marine Service

42- Analysis done based on data from Krause et al. 2024 and Soto-Navarro et al. 2020.

43- Marzeion et al. 2018

44- Estimated based on data from FAO

Global Forest Resources Assessment 2020

45- Estimated based on data from the U.S.

Energy Information Administration (EIA)

A WARMING CLIMATE, GROWING CHALLENGES



OF UNESCO-DESIGNATED SITES HAVE EXPERIENCED

at least one extreme climate condition since 2000, with extreme heat being the most prevalent⁴⁶

Glaciers in UNESCO-designated sites have lost more than

2500 Gt
of ice since 2000,
contributing to **over 5%**
of global mean sea level rise.⁴⁷

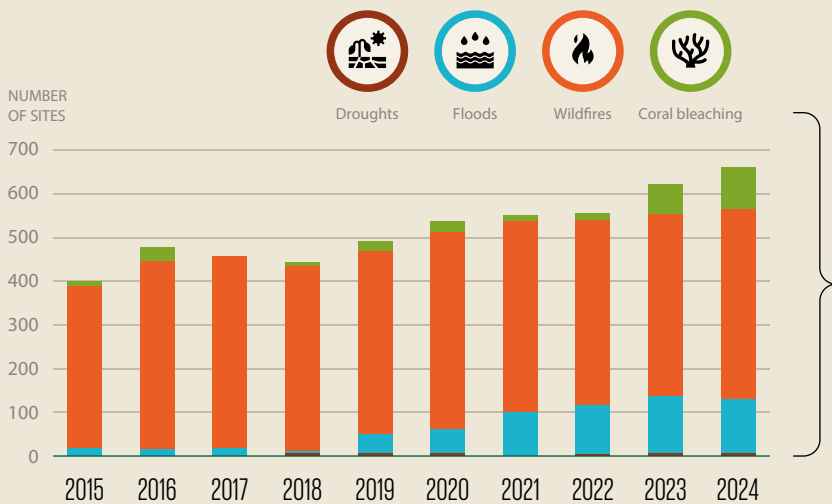


Mountain glaciers in UNESCO-designated sites have lost

9%
of their volume
since 2000⁴⁸

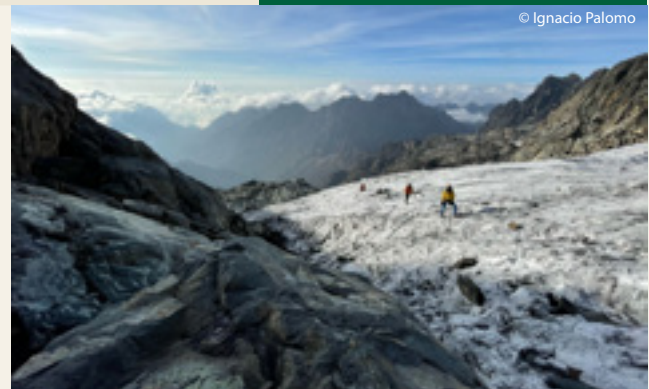
Oceans in UNESCO-designated sites is about

10% more acidic
than in 2000⁴⁹



The number of UNESCO-designated sites impacted by climate-related hazards has increased by

40%
in the last decade⁵⁰



PROVIDING EMERGENCY SUPPORT IN TIMES OF CRISIS

UNESCO has established rapid-response mechanisms to protect designated sites in times of crisis. The **Rapid Response Facility (RRF)** provides emergency funding and technical support to sites facing sudden threats such as floods, wildfires, storms, and conflict, enabling swift action to limit damage and protect biodiversity. The Heritage Emergency Fund (HEF) extends this support to cultural heritage, contributing to preparedness, response, and recovery efforts while strengthening the resilience of affected communities.

For more information: <https://whc.unesco.org/en/rapidresponse/>

GLACIER LOSS, CULTURAL IMPACT

In the **Rwenzori Mountains (WH)**, glaciers are projected to disappear by 2050 due to climate change, threatening both water resources and the spiritual traditions of the Bakonzo people. Known as the "Mountains of the Moon," these peaks are sacred in Bakonzo cosmology and believed to be the dwelling place of ancestral spirits. As the ice vanishes, rituals and cultural identity are at risk. UNESCO is supporting the Uganda Wildlife Authority (UWA) in glacier monitoring, helping document this rapid retreat and its environmental and cultural consequences.

46- Analysis done based on data from HIST, 2025

47- Analysis done based on data updated from Mouginit et al. 2019 and Hugonnet et al. 2021

48- Analysis based on data updated from Hugonnet et al. 2021

49- Analysis done based on Copernicus Marine Service

50- Analysis based on data from Global Forest Watch (GFW) for fires, Global Disaster Awareness and Coordination System (GDACS) for floods and droughts, and National Oceanic and Atmospheric Administration (NOAA) Coral Reef Watch for coral bleaching

ESCALATING PRESSURES, ENDURING IMPACTS

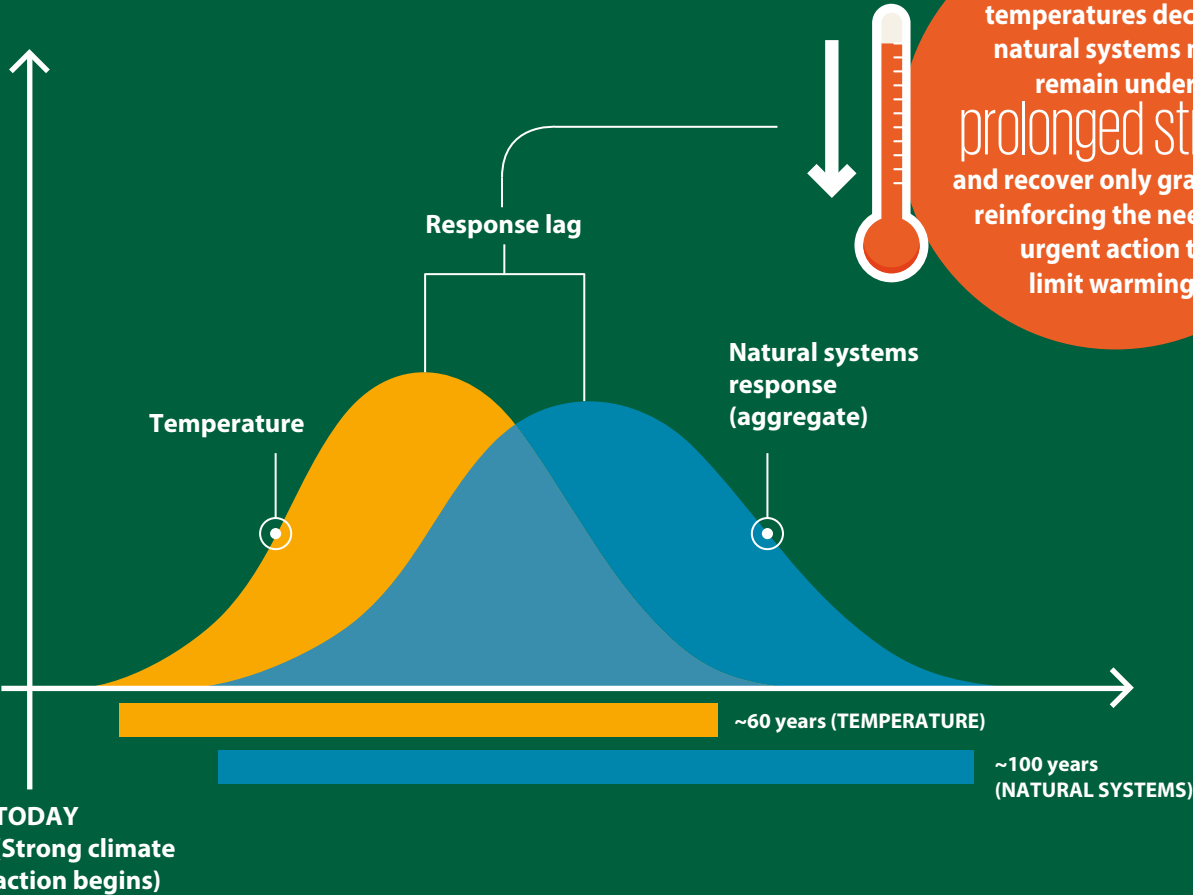
X3

The number of UNESCO-designated sites projected to experience additional climate and biodiversity pressures could triple by 2050



	 Approximate warming (°C) by 2050	 Percentage of UNESCO-designated sites projected to experience additional biodiversity loss ⁵¹	 Percentage of UNESCO-designated sites projected to experience additional exposure to extreme climate conditions ⁵²
LOW EMISSIONS	~1.5	12	15
HIGH EMISSIONS	~2.1	35	40

SIMPLIFIED OVERVIEW OF NATURAL SYSTEM RESPONSES TO CLIMATE CHANGE⁵³



51- Analysis done based on data from HIST, 2025

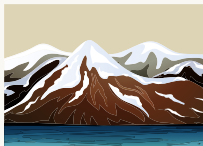
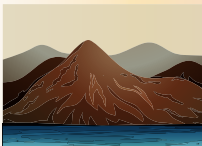
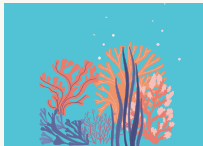
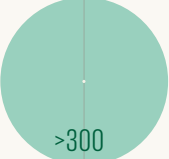
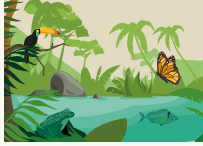
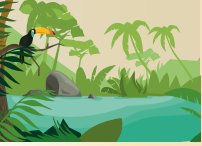
52- Analysis done based on data from Pereira et al. 2024

53- Adapted from Meyer et al. 2022

APPROACHING CRITICAL TIPPING POINTS



As pressures increase, multiple natural systems in over **1/4 OF UNESCO-DESIGNATED SITES** could reach **critical tipping points**, some of which may be irreversible, by 2050

	Now (Observed trend)	2050 (Critical threshold / tipping point)	Estimated number of sites potentially reaching critical thresholds by 2050	Hotspots
GLACIERS ⁵⁴	 Accelerated glacial retreat	 Irreversible loss of glacier mass (functional disappearance)	 >40	Tropical glaciers
CORAL REEFS ⁵⁵	 Frequent coral bleaching events	 Annual severe bleaching causing ecosystem collapse (no recovery)	 >90	Tropical coral reefs
FRESHWATER ⁵⁶	 Increasing water demand and stress	 Chronic water stress (where demand is nearing available supply, potentially undermining freshwater ecosystems)	 >300	Mediterranean, Middle East, South Asia, Sub-Saharan Africa
BIODIVERSITY ⁵⁷	 Ecosystem change (growing pressures and shifting species ranges)	 Ecosystem reorganization (ecological disruption and species displacement)	 >70	Tropics
FORESTS ⁵⁸	 Increased greenhouse gases (GHG) emissions	 Net carbon source (forest emits more CO ₂ than it absorbs)	 >90	Asia-Pacific, Boreal high-latitude
TOTAL NUMBER OF SITES			>590	

 EVERY 10°C OF WARMING AVOIDED could halve the number of sites at risk of major disruption by 2100⁵⁹.		 Approximate warming (°C) by 2100	 Percentage of UNESCO-designated sites reaching critical tipping points by 2100
	LOW EMISSIONS	~1.8	 >25
	MEDIUM EMISSIONS	~2.7	 >40
	HIGH EMISSIONS	~3.6	 >75

54- Analysis done based on data from Zekollari et al. 2025 and Mountain Competence Center, University of Innsbruck, 2025

55- Analysis done based on data from Mellin et al. 2024

56- Analysis done based on data from World Resources Institute (WRI) Aqueduct Water Risk Atlas

57- Analysis done based on data from Pigot et al. 2023

58- Analysis based on data from Global Forest Watch (GFW)

59- Analysis done based on data from references 54 to 58 Liu et al. 2024, and Ravinandrasana and Franzke, 2025. Estimates should be taken with caution given uncertainties

PATHWAYS FOR ACTION



1 SCALING-UP ECOLOGICAL RESTORATION AND SUSTAINABLE LAND USE

UNESCO-designated sites, offer a major yet underutilized **opportunity to scale high-impact ecological restoration**, improve ecosystem connectivity, and promote sustainable land-use practices and promote sustainable land-use practices, delivering simultaneous benefits for biodiversity, climate mitigation, and human well-being. Around 80% of this potential is located within Biosphere Reserves.

RESTORATION AS A CORE MANAGEMENT OBJECTIVE

With around



of sites degraded to a point where **their ecosystems struggle to sustain biodiversity⁶⁰**, there is a **critical need** to restore ecosystem functionality and services, and embed restoration targets into management plans and monitoring systems.

SUSTAINABLE LAND USE PRACTICES ENABLE CONTINUED BIODIVERSITY GAINS



Sustainable land use could support continued gains in biodiversity in UNESCO-designated sites, of around 1% per decade—an encouraging trajectory, given that global biodiversity declined by 2 to 11% over the 20th century.⁶¹

FOREST RESTORATION IN HISTORICAL ECOSYSTEMS

Restoring forests where they have historically occurred outside of urban areas or croplands.



~150.000 km²

of degraded forest landscapes **could be restored**



of **global forest restoration potential** (an area larger than Nepal)



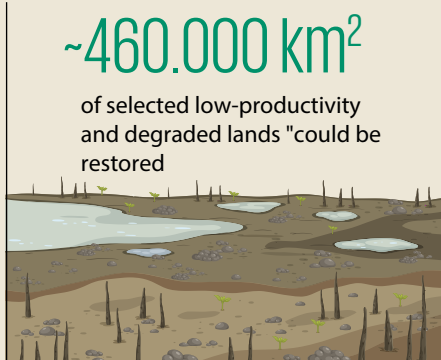
1.2 Gt C⁶²

stored over the next 30 years

Equivalent to the lifetime emissions of **~30 million cars**

RESTORATION OPPORTUNITIES IN LOW-PRODUCTIVITY AND DEGRADED LANDS

Targeted restoration of selected agricultural and pasture lands provides a complementary pathway. Focusing on degraded or very low-yield lands, can deliver significant biodiversity and climate benefits without compromising livelihoods or agricultural production.



~460.000 km²

of selected low-productivity and degraded lands "could be restored"



2 Gt C⁶³ stored

Equivalent to Sweden's carbon stock, where about **70%** of the land is covered by forests

LOCALLY LED AND RIGHTS-BASED RESTORATION APPROACHES

Effective restoration depends on socially inclusive, context-specific and locally driven approaches, ensuring that:

- ✓ trade-offs with food security and livelihoods are assessed and managed,
- ✓ decisions are informed by environmental and social impact assessments, to address adverse effects on biodiversity and ecosystems locally
- ✓ actions result from participatory decisions, and respect the Free, Prior, and Informed Consent (FPIC) of Indigenous Peoples and local communities.

60- Analysis done based on the Biodiversity Intactness Index (BII)

61- Analysis done based on data from Pereira et al. 2024

62- Analysis done based on data from Fesenmyer et al. 2025

63- Analysis based on data from Strassburg et al. 2020



© UNESCO / Federico Rios

RESTORING MANGROVES, STRENGTHENING COMMUNITIES

The **MangRes initiative**,⁶⁴ led by UNESCO with support from the Government of Flanders (Belgium) and Spain's National Parks Autonomous Agency (OAPN), promotes mangrove restoration and conservation as nature-based solutions in seven Latin American biosphere reserves, including small islands like Colombia's **Seaflower Biosphere Reserve (BR)**. The initiative combines scientific research with local knowledge to restore and monitor mangrove ecosystems while strengthening education for sustainable development and promoting sustainable livelihoods.

64- <https://www.unesco.org/en/mab/mangres>

SUSTAINABLE USE OF BIODIVERSITY: EMPOWERING WOMEN THROUGH BEEKEEPING

Nearly 75% of global crops depend on pollinators such as bees, contributing an estimated 500 billion USD of their overall value. Through the Guerlain-funded Women for Bees⁶⁵ initiative, UNESCO supports women beekeepers worldwide while promoting solutions to address the global decline of pollinators. In India, across the forested landscapes of the **Western Ghats (WH)** and **Nilgiri (BR)**, 50 women are currently being trained in sustainable beekeeping practices using the native Indian honeybee (*Apis cerana indica*).

65- <https://www.unesco.org/en/mab/women-bees>



© UNESCO / Rajiv Solanki



© Marcus Biazatti

FOSTERING INCLUSIVE GOVERNANCE THROUGH SUSTAINABLE BUSINESSES IN THE AMAZON

In Brazil's **Central Amazon (WH, BR)**, development models have long overlooked local social-ecological realities, driving resource overuse, forest loss, and the decline of species such as rosewood (*Aniba rosaeodora*). The Amazon project⁶⁶, supported by LVMH, working with the Institute for Conservation and Sustainable Development of the Amazon (IDESAM) and the Uatumbá Sustainable Development Reserve Community Association (AACRDSU), supports riverine families in producing essential oils from rosewood and copal. By strengthening local organizations and valuing traditional agroforestry systems, the initiative promotes inclusive, community-driven conservation and development.

66- <https://www.unesco.org/en/amazon-biosphere-reserves-project>

2 ADVANCING INTEGRATED MANAGEMENT AND TRANSBOUNDARY COOPERATION

UNESCO-designated sites enable a shift from fragmented approaches to integrated, more inclusive, and well-connected landscape and seascape management strategies to tackle biodiversity loss, climate change, and unsustainable land and resource use.

LEVERAGING UNESCO-DESIGNATED SITES FOR ADAPTATIVE AND INCLUSIVE MANAGEMENT



30,000+
PROTECTED AREAS⁶⁷

UNESCO-designated sites encompass over 30,000 protected areas and build on these foundations to improve integrated, coordinated and adaptive responses to emerging challenges, particularly climate change. They strengthen integrated management by:

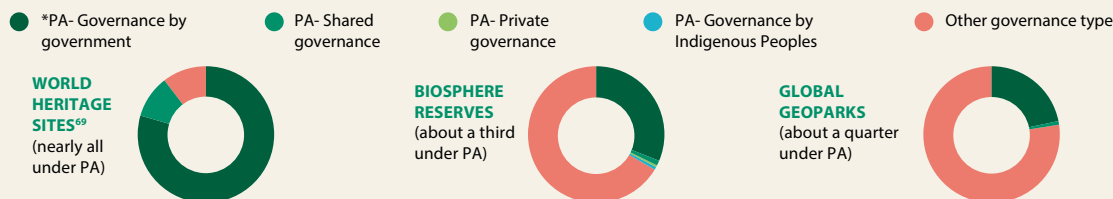
- ✓ Providing global management standards and networks of practitioners supporting adaptive and risk-informed decision-making, including disaster risk reduction and preparedness
- ✓ Enhancing the integration of scientific and Indigenous and Local Knowledge (ILK).
- ✓ Fostering scientific research and environmental education

PROMOTE COLLABORATIVE GOVERNANCE BEYOND PROTECTED AREAS

Many sites extend beyond strictly protected areas into surrounding landscapes where people live and work. **A key objective of these sites is the development and implementation of integrated management plans to guide conservation and sustainable development.** This offers important opportunities to advance integrated management by:

- ✓ Promoting sustainable land and resource use in buffer and transition zones;
- ✓ Recognizing and supporting conservation efforts led by local communities and other stakeholders, through Other Effective Area-Based Conservation Measures (OECMs);
- ✓ Enhancing ecological connectivity across fragmented habitats.

THE DIVERSITY OF GOVERNANCE TYPES IN UNESCO-DESIGNATED SITES⁶⁸



*PA: Protected Areas

ANCHORING TERRITORIAL-SCALE APPROACHES TO PROMOTE DIALOGUE, TRUST-BUILDING AND PEACE

Ecosystems and ecological processes extend beyond administrative and national borders. UNESCO-designated sites provide a strong foundation for territorial-scale approaches that connects protected areas with surrounding landscapes and across countries. They offer important opportunities to:

- ✓ Scaling up integrated management and ecological connectivity beyond individual territories and across large, fragmented landscapes and seascapes
- ✓ Strengthening coordination among stakeholders across sectors and governance levels;
- ✓ Fostering transboundary cooperation for the joint management of shared ecosystems, water systems, and climate-related risks;
- ✓ Promoting dialogue, trust-building, and peace through shared stewardship of natural resources across borders.

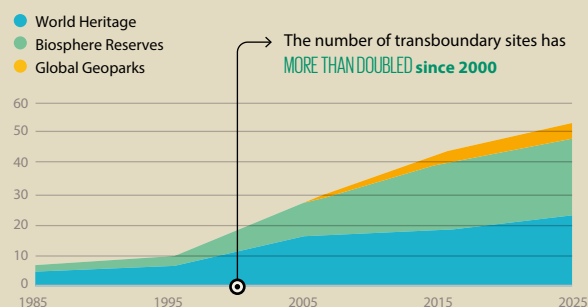
São Tomé and Príncipe

is the world's first entire country designated as a biosphere reserve



With the Island of Príncipe (designated in 2012) and São Tomé Island Biosphere Reserve (designated in 2025), **100% of the African country is now recognized under this status.**

50+ UNESCO-DESIGNATED SITES ARE TRANSBOUNDARY



© Jean-Baptiste Deffontaines

67- Analysis done based on data from IUCN and UNEP-WCMC

68- Analysis done based on data from IUCN and UNEP-WCMC

69- Only natural and mixed World Heritage sites

LINKING ECOLOGICAL CORRIDORS AND TRANSBOUNDARY COOPERATION

Supported by the Kunming Biodiversity Fund (KBF), the UNESCO-led “Scaling up Connectivity” project⁷⁰ advanced ecological connectivity in the **Trifinio-Fraternidad Transboundary Biosphere Reserve (BR) in El Salvador, Guatemala, and Honduras**. Combining geospatial modelling and local knowledge to map and prioritise ecological corridors, it helped identified sustainable livelihoods and targeted ecological restoration opportunities. The project strengthened transboundary and long-term landscape connectivity planning through trilateral participatory workshops, a corridor prioritization framework, and monitoring indicators.

70- <https://www.unesco.org/en/articles/scaling-connectivity-trifinio-fraternidad-transboundary-biosphere-reserve>

© UNESCO / SEED



© Zaruba Ondrej / Shutterstock.com*

MANAGING SHARED ECOSYSTEMS AT THE BASIN SCALE

The **Okavango Delta (WH)** in Botswana is one of the world's largest inland wetlands, supporting exceptional biodiversity and sustaining the livelihoods of local communities across the Okavango River Basin. Its ecological integrity depends on water flows originating in upstream countries and on the movement of wildlife, including large elephant populations that migrate across national borders, making basin-wide cooperation essential. In this context, Angola, Namibia and Botswana are engaged in ongoing efforts towards a potential extension of the World Heritage site to better reflect the transboundary nature of the ecosystem, with support from UNESCO. This process highlights the importance of coordinated approaches to managing water resources, biodiversity and livelihoods across borders, illustrating how transboundary cooperation can support more integrated management of shared ecosystems at the landscape scale.

© Tamara Merino

SUSTAINABLE USE THROUGH TRADITION: REVIVING ANCESTRAL VICUÑA MANAGEMENT

In **Chile's Lauca Biosphere Reserve (BR)**, community-based management of vicuñas is strengthened through the revival of ancestral practices such as the *chaku*—a non-lethal herding and shearing technique. Supported by UNESCO⁷¹, this approach brings together scientific knowledge, Indigenous practices and local governance to promote the sustainable use of this iconic species while improving livelihoods.

By reconnecting cultural traditions with conservation, it demonstrates how integrated management approaches can align biodiversity protection, sustainable resource use and community well-being within a single territorial framework. It also highlights how locally grounded, biocultural practices can contribute to more coherent and context-specific management strategies.

71- <https://www.unesco.org/en/articles/community-management-vicunas-expands-chiles-lauca-biosphere-reserve>



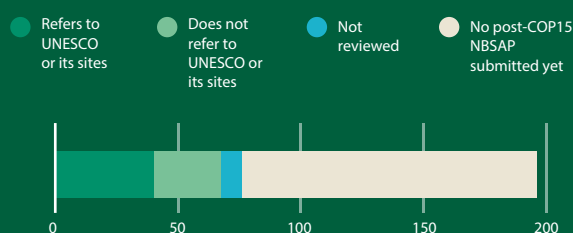
3. MOBILIZING UNESCO-DESIGNATED SITES FOR POLICY IMPLEMENTATION

UNESCO-designated sites translate global policy ambitions into concrete, place-based action. Positioned at the intersection of climate, biodiversity, culture and development, they provide platforms to integrate policies at local, national and international levels, delivering tangible benefits by serving as:

- ✓ Operational platforms supporting countries in navigating trade-offs and delivering on multiple international commitments simultaneously;
- ✓ Reference systems for tracking progress toward global targets.

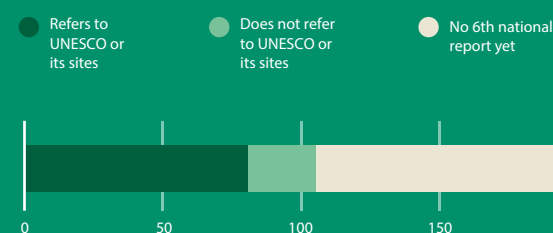
AROUND
50%

of countries' National Biodiversity Strategies and Action Plans (NBSAPs), developed under the Convention on Biological Diversity (CBD),⁷² reference UNESCO or its sites, providing a strong foundation to further embed them and translate recognition into measurable outcomes through targets, funding, indicators, and implementation mechanisms.



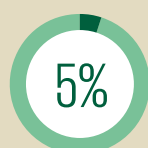
MORE THAN
80%

of the latest national biodiversity progress reports (6th) submitted to the CBD⁷³ reference UNESCO or its sites, highlighting their contribution to biodiversity conservation and sustainable use, as well as monitoring.



AN UNTAPPED POTENTIAL IN CLIMATE ACTION

ONLY AROUND



of countries' Nationally Determined Contributions (NDCs)⁷⁴ under the UN Framework Convention on Climate Change (UNFCCC) explicitly include UNESCO-designated sites, pointing to an untapped opportunity to enhance their role in climate mitigation, adaptation, and risk reduction, and to support more effective responses to climate-related hazards.

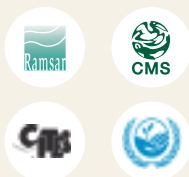
INTEGRATING CULTURAL HERITAGE IN CLIMATE POLICIES

Culture has long been overlooked in climate frameworks, despite its role in shaping adaptation and resilience. The adoption of five cultural heritage indicators under the UNFCCC marks a step towards recognizing and measuring these contributions. In practice, they make it possible to track how cultural practices and traditional knowledge help communities respond to climate risks. UNESCO-designated sites bring this shift to life, demonstrating how integrated nature–culture approaches can strengthen resilience.

STRENGTHENING CROSS-SECTORAL SYNERGIES WITH CONVENTIONS AND UNITED NATIONS DECADES

UNESCO's designations provide a unique basis for **cross-sectoral alignment** and **integrated implementation**, mobilizing UNESCO focal points and networks to support national implementation and strengthen coherence across global frameworks:

- Strengthen synergies between UNESCO's conventions and programmes and other frameworks** (e.g., Ramsar, CMS) through participatory, integrated governance to enable a more coordinated and effective implementation across agendas.



- Scaling up UN Decades' implementation** - UNESCO-designated sites support policy alignment, generate data and knowledge, and provide concrete locations and networks to translate global commitments made through UN Decades into action at national and local levels.



72- Analysis of Post-COP15 NBSAPs as of February 2026 done by UNESCO

73- Analysis of Sixth National Reports to the CBD as of February 2026 done by UNESCO

74- Analysis of NDCs as of February 2026 done by UNESCO



© UNESCO / Joan de la Malla

STRENGTHENING NATIONAL ECOSYSTEM ASSESSMENTS WITH INDIGENOUS AND LOCAL KNOWLEDGE

UNESCO-designated sites play an important role in strengthening National Ecosystem Assessments (NEAs), including through the **BES-Net partnership**⁷⁵, by bringing together scientific knowledge and Indigenous and Local Knowledge (ILK). These nationally driven assessments inform biodiversity policies and contribute to global targets by integrating diverse knowledge systems. Through UNESCO's Local and Indigenous Knowledge Systems (LINKS) Programme, participatory approaches support the meaningful inclusion of ILK holders in assessment processes. In this context, UNESCO-designated sites serve as key entry points for generating and mobilizing context-specific knowledge to inform policy and decision-making. For example, sustainable community practices in the **Tonle Sap Biosphere Reserve (BR) in Cambodia** have contributed to the country's NEA synthesis.

75- <https://www.unesco.org/en/links/bes-net>

TACKLING MULTIPLE OBJECTIVES WITH MULTI-DESIGNATED SITES

On **Jeju Island (WH, BR, GP) in the Republic of Korea**, the combination of UNESCO designations—World Heritage site, Biosphere Reserve and Global Geopark—reflects its exceptional ecological, geological and cultural values. This multi-designated status enables integrated territorial approaches that support the alignment of conservation, sustainable development, research and education objectives within a single policy-relevant framework. As host of the **Global Research and Training Centre for Internationally Designated Areas (GCIDA)**,⁷⁶ Jeju contributes to strengthening the science-policy interface through research, training and knowledge exchange across UNESCO-designated sites. This illustrates how multi-designated sites can support the implementation of integrated policy responses, providing practical models for advancing coherence across biodiversity, climate and sustainable development agendas.

76- <https://www.unesco-gcida.org/>



© Pink stockers - Shutterstock*



© UNESCO / FrancisTack

INTEGRATING CULTURAL HERITAGE IN CLIMATE POLICIES

The **UNESCO World Heritage Canopy** initiative has played a key role in advancing the integration of cultural heritage into global climate policy. By mobilizing knowledge, evidence and experience from World Heritage sites, it has helped demonstrate how cultural practices and heritage systems contribute to climate adaptation and resilience.⁷⁷

This work has informed international processes, including the development of cultural heritage indicators under the United Nations Framework Convention on Climate Change (UNFCCC), the global framework guiding climate action. These indicators are designed to make the contributions of cultural heritage more visible and measurable, providing a way to track how cultural practices and traditional knowledge support adaptation and resilience, and to better integrate these dimensions into climate policy and decision-making.

77- <https://whc.unesco.org/en/canopy/>

4

ENHANCING UNESCO-DESIGNATED SITES AS SCIENCE, KNOWLEDGE, AND EDUCATION HUBS

UNESCO-designated sites serve as hubs for science, knowledge and education, connecting scientific research, Indigenous and Local Knowledge (ILK), and cultural practices within their territories and across global and thematic networks. Through UNESCO's thematic programmes, they foster learning, capacity-building and knowledge exchange, supporting inclusive governance and enabling evidence-based action to address biodiversity loss, climate change and sustainable development challenges.

ADVANCING INCLUSIVE GOVERNANCE

Across regions, UNESCO-designated sites demonstrate approaches that reflect local contexts and diverse knowledge systems, including those advanced through UNESCO's Local and Indigenous Knowledge Systems (LINKS) Programme⁷⁸:

- ✓ Supporting co-management arrangements involving Indigenous Peoples and local communities (IPLCs);
- ✓ Promoting participatory processes and dialogue across governance levels;
- ✓ Grounding governance approaches in cultural values and local priorities, as well as promoting Indigenous and Local Knowledge.



More than

140 SEA-LEVEL MONITORING STATIONS

contributing to the Intergovernmental Oceanographic Commission (IOC) Sea Level Monitoring Station Facility are located across nearly 100 UNESCO-designated sites.⁷⁹

1 IN 8 MOUNTAIN OBSERVATORIES

are located in UNESCO-designated sites, making them key hubs for monitoring global change in mountain regions.⁸⁰



STRENGTHENING KNOWLEDGE SYSTEMS WITH SCIENTIFIC RESEARCH AND THEMATIC NETWORKS

- ✓ UNESCO-supported platforms, including the UNESCO Sites Navigator and the Ocean Biodiversity Information System (OBIS), provide accessible data that support research, learning and informed site management;
- ✓ Monitoring, data collection, and knowledge co-production involving scientific and Indigenous and Local Knowledge systems to inform policy and practice;
- ✓ Scientific cooperation, peer learning, and knowledge exchange across regions through UNESCO's thematic networks;
- ✓ Use of interdisciplinary approaches combining natural sciences with social and human sciences (SHS) as well as locally-grounded evidence to inform policy and practice.

BUILDING CAPACITY THROUGH EDUCATION FOR SUSTAINABLE DEVELOPMENT (ESD)

UNESCO-designated sites, as part of global networks, provide a foundation for strengthening capacities across scales, including:

- ✓ Education for Sustainable Development (ESD), a UNESCO-led programme, fosters the knowledge, skills and values needed to support sustainability, empowering communities and site stakeholders to engage in informed decision-making and collective action;⁸¹
- ✓ Knowledge exchange and intergenerational learning, linking scientific perspectives with Indigenous and Local Knowledge (ILK), to strengthen mutual understanding, sustain cultural continuity, and support more inclusive and context-specific approaches to site management;



Through its Education for Sustainable Development (ESD) programme, UNESCO mobilized its designated sites as real-world learning hubs for climate, environmental and ocean literacy. Implemented across more than 40 sites in over 25 countries, **14,000 learners** have been engaged in this initiative, strengthening collaboration between site managers and education authorities, demonstrating a scalable model for embedding sustainability into education systems.

78- <https://www.unesco.org/en/links>

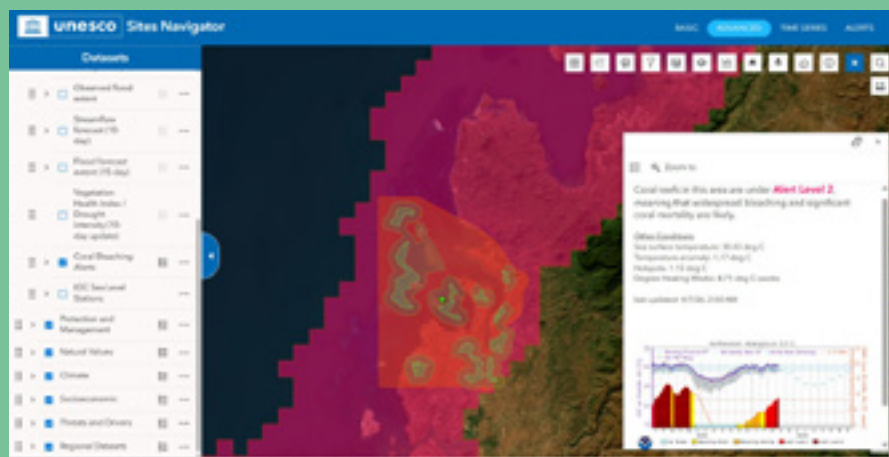
79- <https://www.ioc-sealevelmonitoring.org/>

80- GEO Mountains (2025)

81- <https://www.unesco.org/en/sustainable-development/education>

UNESCO SITES NAVIGATOR: MONITORING CHANGE AND TRACKING GLOBAL IMPACT

The Sites Navigator, UNESCO's institutional platform for monitoring change and tracking global impact across designated sites, is an interactive geospatial platform that brings together data on World Heritage sites, Biosphere Reserves and Global Geoparks. Using satellite data and other reliable sources, it provides near real-time information on environmental changes and risks, such as fires, habitat loss and human pressures. Beyond early warning alerts, the platform also helps track how these sites contribute to global climate and biodiversity goals, offering a shared evidence base to monitor progress, inform decisions and strengthen coordinated action across conservation efforts worldwide.⁸²



82- <https://www.unesco.org/en/lists-designations/site-navigator>



© Fiston Wasanga

BUILDING CLIMATE AND BIODIVERSITY RESEARCH CAPACITIES

In the heart of the Congo Basin, the **Yangambi Biosphere Reserve in the Democratic Republic of the Congo** is emerging as a hub for climate and biodiversity knowledge. By linking forest conservation, sustainable agriculture, and science, UNESCO supports⁸³ both environmental integrity and community well-being. With the support of the Government of Belgium, trained eco-guards protect wildlife, while local associations develop sustainable livelihoods. The CongoFlux Tower, operated by Ghent University, generates open-access data on greenhouse-gas exchanges, deepening insight into tropical forest dynamics and informing climate action. Together, these efforts strengthen local capacities, foster scientific collaboration, and support knowledge sharing across scales.

83- <https://www.unesco.org/fr/articles/yangambi-lunesco-lance-un-projet-de-4-millions-deuros-sur-la-protection-de-la-biodiversite>

GLOBAL SCIENTIFIC NETWORKS FOR COLLABORATIVE ACTION

Across diverse environments—from mountains to coastal and marine environments—UNESCO supports scientific collaboration for action through a range of global initiatives. Among these, the World Network of Mountain Biosphere Reserves⁸⁴ advances research and knowledge exchange in highland socioecological systems, while the World Heritage Marine Site Managers Network⁸⁵ connects practitioners across marine World Heritage sites to share expertise, strengthen conservation capacity, and coordinate responses to common challenges. Though focused on distinct domains, these initiatives illustrate how UNESCO fosters international cooperation, knowledge exchange, and collective solutions to biodiversity loss and climate change.

84- <https://www.mountainbiosphere.org/en/>

85- <https://whc.unesco.org/en/marine-managers/>



© UNESCO / Hjortborg Tausen

CONCLUSION

This first global assessment highlights a central and encouraging finding: despite intensifying environmental pressures worldwide, UNESCO-designated sites demonstrate a high level of resilience, forming a unique global network in which people and nature remain deeply interconnected. This resilience is reflected in their capacity to adapt to change while continuing to safeguard ecological integrity, cultural heritage, and community well-being, making them critical reference points for understanding how integrated social–ecological systems can endure and evolve under growing global pressures.

DISTINCT MISSIONS, A SHARED OUTCOME: RESILIENCE

While each UNESCO designation serves a distinct mandate, all converge toward a common outcome: resilience. World Heritage sites safeguard places of outstanding universal value, including cultural landscapes shaped by long-standing interactions between people and the environment. Biosphere Reserves promote balanced relationships between conservation and sustainable development through research, innovation, and education. UNESCO Global Geoparks integrate the protection of geological heritage with public awareness, education, and local economic development.

Despite differences in purpose and governance, the findings reveal a consistent pattern: all three designations strengthen the capacity of ecosystems, communities, and landscapes to withstand, adapt to, and recover from accelerating change. Where designations overlap, multi-designated sites illustrate how these approaches can operate in parallel, addressing complementary objectives while reinforcing one another. Across regions, UNESCO-designated sites conserve biodiversity, regulate climate, support livelihoods, and sustain diverse cultural identities, demonstrating that multiple pathways can contribute to more resilient societies and landscapes in a rapidly changing world.

HUBS OF KNOWLEDGE, EDUCATION, AND COOPERATION

UNESCO-designated sites are not only areas of protection; they are hubs of knowledge, education and cooperation, bringing together scientific research, Indigenous and local knowledge, and international partnerships to strengthen local stewardship and global understanding. In this context, they offer powerful, real-world learning opportunities to equip learners of all ages with the knowledge, values and skills needed to take informed action for environmental integrity, economic viability and a just society for present and future generations.

Their value lies not only in what they conserve, but also in the exchanges they foster across borders, disciplines, and generations. By promoting learning, innovation, and collaboration, these sites support collective responses to shared environmental and cultural challenges, while contributing to dialogue, mutual understanding, and peace.

IMPORTANT GAPS IN KNOWLEDGE PERSIST

While this assessment is the most comprehensive to date, important gaps in knowledge remain. Data limitations are particularly significant in marine environments and in relation to pressures associated with tourism and other human activities. Substantial gaps also persist in the assessment of cultural heritage dimensions, especially intangible values such as traditional knowledge, cultural practices, spiritual connections, and sense of place, which remain less systematically documented than environmental change.

These gaps are critical, as many of the most profound impacts on UNESCO-designated sites involve non-economic losses that are not easily quantified, including the erosion of cultural identity, weakened social cohesion, and the loss of Indigenous and local knowledge. Addressing these gaps will require more inclusive and integrated monitoring approaches that better capture ecological, cultural, and social dimensions, ensuring that future assessments reflect the full range of values these sites sustain.

INVESTING NOW TO SECURE THE FUTURE

Securing the future of UNESCO-designated sites requires investment commensurate with their global significance. Many sites operate with limited financial and technical capacity, while the demands of stewardship continue to increase—from climate adaptation and ecosystem restoration to monitoring, education, and community engagement. In many regions, funding remains fragmented, short-term, or insufficient to support long-term resilience.

Deepening understanding of how resilience is built and sustained across UNESCO-designated sites should now be a priority. This includes examining the governance systems, management approaches, and knowledge practices that enable sites to withstand, adapt to, and recover from change. Strengthening exchanges across sites and designations can help identify context-specific and transferable lessons, supporting more effective and integrated approaches to resilience within and beyond site boundaries.

Investing in UNESCO-designated sites is therefore not only an investment in remarkable places, but also in approaches that have already demonstrated their value in sustaining both people and nature. Across diverse contexts, these sites have shown that it is possible to maintain ecological integrity, support livelihoods, and preserve cultural identities in the face of accelerating change. In a context of intensifying environmental and socio-economic pressures, reinforcing their protection, ensuring adequate and sustained resourcing, and strengthening their integration into broader policy frameworks is an urgent shared responsibility. This calls for renewed commitment from Member States, strengthened international cooperation, and strengthened alignment of action across sectors and scales. As pressures continue to grow, the role of UNESCO-designated sites as anchors of resilience becomes increasingly significant, underscoring their importance as a foundation for advancing sustainability, equity, and long-term societal resilience for present and future generations.

BIBLIOGRAPHY

1. CONNECTING PEOPLE AND NATURE

SUPPORTING LIVELIHOODS AND ECONOMIES

Population

Liu, L., Cao, X., Li, S., & Jie, N. A. (2024). A 31-year (1990–2020) global gridded population dataset generated by cluster analysis and statistical learning. *Scientific Data*, 11(1), 124. <https://doi.org/10.1038/s41597-024-02913-0>

Languages

World Atlas of Language Structures (WALS) (Available at: <https://wals.info>)

Native Land (Available at: <https://native-land.ca/>)

GDP

Kummu, M., Kosonen, M. & Masoumzadeh Sayyar, S. 2025. Downscaled gridded global dataset for gross domestic product (GDP) per capita PPP over 1990–2022. *Scientific Data* 12: 178. <https://doi.org/10.1038/s41597-025-04487-x>

Tourism

Adamiak, C. & Szyda, B. (2021). Combining Conventional Statistics and Big Data to Map Global Tourism Destinations Before COVID-19. *Journal of Travel Research*. 61. 1848-1871. [10.1177/00472875211051418](https://doi.org/10.1177/00472875211051418).

World Heritage Periodic Reporting. Available at <https://whc.unesco.org/en/periodicreporting/>

INDIGENOUS KNOWLEDGE, ANCESTRAL PLACES

Indigenous People's Lands and Territories

LandMark. (2024). Indigenous Peoples' Lands & Territories and Local Community Lands. Data file from LandMark: The Global Platform of Indigenous and Community Lands. Available at www.landmarkmap.org

Garnett, S. T., Burgess, N. D., Fa, J. E., Fernández-Llamazares, Á., Molnár, Z., Robinson, C. J., ... & Leiper, I. (2018). A spatial overview of the global importance of Indigenous lands for conservation. *Nature sustainability*, 1(7), 369-374.

Pastoralism

World pastoralist map. Available at: <http://www.pastoralpeoples.org/pastoralist-map/>

Case studies

UNESCO. 2025. Indigenous Knowledge, Ancestral Places: Navigating Change in UNESCO Designated Sites, UNESCO, 2025. Available at <https://unesdoc.unesco.org/ark:/48223/pf0000395661>

2. LIFELINES FOR A SUSTAINABLE FUTURE

WHY NATURE MATTERS

IPBES (2024). Summary for Policymakers of the Thematic Assessment Report on the Underlying Causes of Biodiversity Loss and the Determinants of Transformative Change and Options for Achieving the 2050 Vision for Biodiversity of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. O'Brien, K., Garibaldi, L., Agrawal, A., Bennett, E., Biggs, O., Calderón Contreras, R., Carr, E., Frantzeskaki, N., Gosnell, H., Gurung, J., Lambertucci, S., Leventon, J., Liao, C., Reyes García, V., Shannon, L., Villasante, S., Wickson, F., Zinngrebe, Y., and Perianin, L. (eds.). IPBES secretariat, Bonn, Germany. DOI: <https://doi.org/10.5281/zenodo.11382230>

World Economic Forum. (2020). The Future of Nature and Business. Geneva: World Economic Forum (in collaboration with AlphaBeta)

Hammerschlag, N. and Gallagher, A.J. (2017). Extinction Risk and Conservation of the Earth's National Animal Symbols. *BioScience*, 67(8), p. 744–749. DOI: [10.1093/biosci/bix054](https://doi.org/10.1093/biosci/bix054).

Deloitte Access Economics (2017). At what price? The economic, social and icon value of the Great Barrier Reef. Available at <http://hdl.handle.net/11017/3205>

United Nations Environment Programme and International Livestock Research Institute (2020). Preventing the Next Pandemic: Zoonotic diseases and how to break the chain of transmission. Nairobi, Kenya

Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland, pp. 35-115, doi: [10.59327/IPCC/AR6-9789291691647](https://doi.org/10.59327/IPCC/AR6-9789291691647)

United Nations Development Programme. (2024). Nature for prosperity. In Nature for Development action kit series. United Nations Development Programme

TESTIMONIES OF EARTH'S HISTORY

Fossils

Paleobiology Database. (2024). Paleobiology Database (data accessed December 6, 2025): <https://paleobiodb.org/>

ADAPTING TO ENVIRONMENT, SHAPING LANDSCAPES

Anthromes

Ellis, E. C., Gauthier, N., Klein Goldewijk, K., Bliege Bird, R., Boivin, N., Díaz, S., ... & Watson, J. E. (2021). People have shaped most of terrestrial nature for at least 12,000 years. *Proceedings of the National Academy of Sciences*, 118(17).

STRONGHOLDS OF NATURE

Biome and ecosystem classification

Dinerstein, E., Olson, D., Joshi, A., Vynne, C., Burgess, N. D., Wikramanayake, E., ... & Saleem, M. (2017). An ecoregion-based approach to protecting half the terrestrial realm. *BioScience*, 67(6), 534-545.

Glaciers

RGI 7.0 Consortium, 2023. Randolph Glacier Inventory - A Dataset of Global Glacier Outlines, Version 7.0. Boulder, Colorado USA. NSIDC: National Snow and Ice Data Center. doi:10.5067/f6jmovy5navz. Online access: <https://doi.org/10.5067/f6jmovy5navz>

Volcanoes

Global Volcanism Program, 2025. [Database] Volcanoes of the World (v. 5.3.4; 30 Dec 2025). Distributed by Smithsonian Institution, compiled by Venzke, E. <https://doi.org/10.5479/si.GVP.VOTW5-2025.5.3>

Corals reefs

UNEP-WCMC (2025). Ocean+ Habitats [On-line], [27 April 2025]. Available at: <https://habitats.oceanplus.org/>.

Rivers (HydroSHEDS)

Lehner, B., Grill G. (2013). Global river hydrography and network routing: baseline data and new approaches to study the world's large river systems. *Hydrological Processes*, 27(15): 2171-2186. <https://doi.org/10.1002/hyp.9740>

Lakes (HydroSHEDS)

Messenger, M.L., Lehner, B., Grill, G., Nedeva, I., Schmitt, O. (2016). Estimating the volume and age of water stored in global lakes using a geo-statistical approach. *Nature Communications*, 7: 13603. <https://doi.org/10.1038/ncomms13603>

Wetlands - Ramsar

Ramsar Convention Secretariat (2025). Ramsar Sites Information Service (RSIS). Available at: <https://rsis.ramsar.org> (accessed: 15 August 2025).

Global distribution of blue carbon (mangroves, seagrasses, saltmarshes)

UNEP-WCMC (2025). Ocean+ Habitats [On-line], [27 April 2025]. Available at: <https://habitats.oceanplus.org/>.

Islands

Sayre, R., S. Noble, S. Hamann, R. Smith, D. Wright, S. Breyer, K... & A. Reed. (2018). A new 30 meter resolution global shoreline vector and associated global islands database for the development of standardized global ecological coastal units. *Journal of Operational Oceanography – A Special Blue Planet Edition*. <https://doi.org/10.1080/1755876X.2018.1529714>

Greenland Icebergs. <https://whc.unesco.org/en/list/1149/>

AN OUTSTANDING DIVERSITY

Key Biodiversity Areas

IUCN (2016) A Global Standard for the Identification of Key Biodiversity Areas, Version 1.0. IUCN, Gland, Switzerland.

Biodiversity

Map of Life Regions. (2025). Species list for UNESCO sites, based on a large number of biodiversity datasets. Generated on (1 September 2025) at <http://mol.org>

OBIS (2025) Ocean Biodiversity Information System. Intergovernmental Oceanographic Commission of UNESCO. <https://obis.org>.

GBIF.org (2025). GBIF Occurrence Download for Orchidaceae. Accessed on 1 September 2025

GBIF.org (2025). GBIF Occurrence Download for Cactaceae. Accessed on 1 September 2025.

REGULATING THE GLOBAL CLIMATE

Terrestrial carbon emissions and removal (forests) / Global Forest Watch (GFW). Data updated from Harris, N. L., Gibbs, D. A., Baccini, A., Birdsey, R. A., De Bruin, S., Farina, M., ... & Tyukavina, A. (2021). Global maps of twenty-first century forest carbon fluxes. *Nature Climate Change*, 11(3), 234-240.

Gibbs, D. A., Rose, M., Grassi, G., Melo, J., Rossi, S., Heinrich, V., & Harris, N. L. (2025). Revised and updated geospatial monitoring of 21st century forest carbon fluxes. *Earth System Science Data*, 17(3), 1217-1243.

Terrestrial carbon stocks

Soto-Navarro, C., Ravilious, C., Arnell, A. P., de Lamo, X., Harfoot, M. B. J., Hill, S. L. L., Wearn, O. R., Santoro, M., Bouvet, A., Mermoz, S., Le Toan, T., Xia, J., Liu, S., Yuan, W., Spawn, S. A., Gibbs, H. K., Ferrier, S., Harwood, T., Alkemade, R., ... Kapos, V. (2020). Above and below ground biomass carbon and soil organic carbon [Data set]. UN Environment Programme World Conservation Monitoring Centre (UNEP-WCMC). <https://doi.org/10.34892/QDB8-BH36>

Seagrasses carbon stock

Krause, J. R., Cameron, C., Arias-Ortiz, A., Cifuentes-Jara, M., Crooks, S., Dahl, M., ... & Fourqurean, J. W. (2025). Global seagrass carbon stock variability and emissions from seagrass loss. *Nature Communications*, 16(1), 3798.

A HAVEN FOR ICONIC FAUNA AND FLORA

Biodiversity – Species-specific populations

UNESCO & IUCN. (2023). *World Heritage: A unique contribution to biodiversity conservation*. UNESCO. Available at <https://unesdoc.unesco.org/ark:/48223/pf0000385392>

CRITICAL PLACES TO PROTECT GLOBALLY THREATENED SPECIES

Map of Life Regions. (2025). Species list for UNESCO sites, based on a large number of biodiversity datasets. Generated on (1 September 2025) at <http://mol.org>

IUCN. (2025). The IUCN Red List of Threatened Species. Version 2025-2. <https://www.iucnredlist.org>. Accessed on 1 March 2025.

UNEP (2022). The Species+ Website. Nairobi, Kenya. Compiled by UNEP-WCMC, Cambridge, UK. Available at: www.speciesplus.net. Accessed [13 April 2025].

VITAL STEPPING STONES FOR MIGRATORY SPECIES

UNEP (2022). The Species+ Website. Nairobi, Kenya. Compiled by UNEP-WCMC, Cambridge, UK. Available at: www.speciesplus.net. Accessed [13 April 2025].

3. RESILIENT SITES UNDER INTENSIFYING PRESSURE

LANDSCAPES AT RISK

Water stress, droughts and Floods

World Resources Institute (WRI) (2025) Aqueduct Water Risk Atlas. <https://www.wri.org/aqueduct> (Accessed on 12 March 2025.)

Coral bleaching

Mellin, C., Brown, S., Cantin, N., Klein-Salas, E., Mouillot, D., Heron, S. F., & Fordham, D. A. (2024). Cumulative risk of future bleaching for the world's coral reefs. *Science Advances*, 10(26), eadn9660.

Extreme heat and heavy precipitation

International Centre on Space Technologies for Natural and Cultural Heritage (HIST). (2025). Exposure of extreme climate events at UNESCO-designated sites under climate change globally. Internal report.

Rising sea-level

Copernicus Marine Service Information (CMEMS). Global Ocean Mean Sea Level trend map from Observations Reprocessing. *Marine Data Store (MDS)*. DOI: <https://doi.org/10.48670/moi-00238> (Accessed on 2 Sep 2026)

All other risks

WWF (2024) WWF Risk Filter Suite version 2.0. <https://riskfilter.org>

EVOLVING PRESSURES, EMERGING RISKS

Human pressures

Theobald, D. M., Oakleaf, J. R., Moncrieff, G., Voigt, M., Kiesecker, J., & Kennedy, C. M. (2025). Global extent and change in human modification of terrestrial ecosystems from 1990 to 2022. *Scientific Data*, 12(1), 606.

Invasive species

Marino, C., Leroy, B., Latombe, G., & Bellard, C. (2024). Exposure and Sensitivity of Terrestrial Vertebrates to Biological Invasions Worldwide. *Global Change Biology*, 30(12), e17607.

Forest cover loss and main drivers / Global Forest Watch (GFW)

Hansen, M. C., Potapov, P. V., Moore, R., Hancher, M., Turubanova, S. A., Tyukavina, A., ... & Townshend, J. R. (2013). High-resolution global maps of 21st-century forest cover change. *science*, 342(6160), 850-853.

Sims, M. J., Stanimirova, R., Raichuk, A., Neumann, M., Richter, J., Follett, F., ... & Harris, N. (2025). Global drivers of forest loss at 1 km resolution. *Environmental Research Letters*, 20(7), 074027.

Tyukavina, A., Potapov, P., Hansen, M. C., Pickens, A. H., Stehman, S. V., Turubanova, S., ... & Harris, N. (2022). Global trends of forest loss due to fire from 2001 to 2019. *Frontiers in Remote Sensing*, 3, 825190.

RESILIENCE IN A CHANGING WORLD

Habitat conditions

Pereira, H. M., Martins, I. S., Rosa, I. M., Kim, H., Leadley, P., Popp, A., ... & Alkemade, R. (2024). Global trends and scenarios for terrestrial biodiversity and ecosystem services from 1900 to 2050. *Science*, 384(6694), 458-465.

Wildlife populations / Living Planet Index (LPI)

McRae, L., Cornford, R., Marconi, V., Puleston, H., Ledger, S. E., Deinet, S., ... & Freeman, R. (2025). The utility of the Living Planet Index as a policy tool and for measuring nature recovery. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 380(1917).

Ledger, S. E., Loh, J., Almond, R., Böhm, M., Clements, C. F., Currie, J., ... & McRae, L. (2023). Past, present, and future of the Living Planet Index. *npj Biodiversity*, 2(1), 12.

Terrestrial carbon emissions and removal (forests) / Global Forest Watch (GFW)

Data updated from **Harris, N. L., Gibbs, D. A., Baccini, A., Birdsey, R. A., De Bruin, S., Farina, M., ... & Tyukavina, A.** (2021). Global maps of twenty-first century forest carbon fluxes. *Nature Climate Change*, 11(3), 234-240.

Gibbs, D. A., Rose, M., Grassi, G., Melo, J., Rossi, S., Heinrich, V., & Harris, N. L. (2025). Revised and updated geospatial monitoring of 21st century forest carbon fluxes. *Earth System Science Data*, 17(3), 1217-1243.

Oceans carbon uptake

Copernicus Marine Service Information (CMEMS). (2026). **Global Ocean Yearly CO₂ Sink from Multi-Observations Reprocessing** Marine Data Store (MDS). DOI: <https://doi.org/10.48670/moi-00223> (Accessed on 24 January 2026)

Seagrass blue carbon stocks in biomass and net primary production

Gomis, E., Strydom, S., Foster, N. R., Montemayor, D., Mateo, M. A., Serrano, E., ... & Serrano, O. (2025). Global estimates of seagrass blue carbon stocks in biomass and net primary production. *Nature Communications*, 16(1), 9530.

Estimate of glacier melt based on emissions

Marzeion, B., Kaser, G., Maussion, F., & Champollion, N. (2018). Limited influence of climate change mitigation on short-term glacier mass loss. *Nature Climate Change*, 8(4), 305-308.

A WARMING CLIMATE, GROWING CHALLENGES

Extreme climate stress

International Centre on Space Technologies for Natural and Cultural Heritage (HIST). (2025). Exposure of extreme climate events at UNESCO-designated sites under climate change globally. Internal report.

Glaciers

Hugonnet, R., McNabb, R., Berthier, E., Menounos, B., Nuth, C., Girod, L., ... & Kääb, A. (2021). Accelerated global glacier mass loss in the early twenty-first century. *Nature*, 592(7856), 726-731.

Mouginot, J., Rignot, E., Björk, A. A., Van den Broeke, M., Millan, R., Morlighem, M., ... & Wood, M. (2019). Forty-six years of Greenland Ice Sheet mass balance from 1972 to 2018. *Proceedings of the national academy of sciences*, 116(19), 9239-9244.

Ocean acidity

Copernicus Marine Service Information (CMEMS). (2026) **Global Ocean acidification** – mean sea water pH time series and trend from Multi-Observations Reprocessing. Marine Data Store (MDS). DOI: <https://doi.org/10.48670/moi-00224> (Accessed on 2 Sep 2026)

Floods and droughts

Global Disaster Alert and Coordination System. (2026). *Global Disaster Alert and Coordination System (GDACS)*. Accessed on 15 January 2026. <https://www.gdacs.org/>

Wildfires

See above cited Global Forest Watch (GFW) references: Harris et al. (2021) ; Gibbs et al. (2025) ; Hansen et al. (2013); Sims et al. (2025); Tyukavina et al. (2022)

Coral bleaching

NOAA Coral Reef Watch. (2026). Thermal History – Annual Maximum Degree Heating Week (DHW) (1985–2025). College Park, MD, USA: NOAA Coral Reef Watch. <https://coralreefwatch.noaa.gov/> (Accessed April 9, 2026)

ESCALATING PRESSURES, ENDURING IMPACTS

Exposure to extreme climate events

Chen, G., Fu, B., Jiang, Y., Suo, X., Lai, Y., Chen, Z., ... & Li, B. (2024). Natural world heritage sites are at risk from climate change globally. *Communications Earth & Environment*, 5(1), 760

Additional biodiversity loss

Pereira, H. M., Martins, I. S., Rosa, I. M., Kim, H., Leadley, P., Popp, A., ... & Alkemade, R. (2024). Global trends and scenarios for terrestrial biodiversity and ecosystem services from 1900 to 2050. *Science*, 384(6694), 458-465.

Natural system response to climate change

Meyer, A. L., Bentley, J., Odoulami, R. C., Pigot, A. L., & Trisos, C. H. (2022). Risks to biodiversity from temperature overshoot pathways. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 377(1857).

APPROACHING CRITICAL TIPPING POINTS

Glaciers projections

Van Tricht, L., Zekollari, H., Huss, M., Rounce, D. R., Schuster, L., Aguayo, R., ... & Farinotti, D. (2025). Peak glacier extinction in the mid-twenty-first century. *Nature Climate Change*, 1-5.

Zekollari, H., Huss, M., Schuster, L., Maussion, F., Rounce, D. R., Aguayo, R., ... & Farinotti, D. (2024). Twenty-first century global glacier evolution under CMIP6 scenarios and the role of glacier-specific observations. *The Cryosphere*, 18(11), 5045-5066.

Mountain Competence Center, University of Innsbruck. (2025). Goodbye Glaciers !? Available at: <https://goodbye-glaciers.info> (Accessed: 9 March 2026).

Coral reefs

Mellin, C., Brown, S., Cantin, N., Klein-Salas, E., Mouillot, D., Heron, S. F., & Fordham, D. A. (2024). Cumulative risk of future bleaching for the world's coral reefs. *Science Advances*, 10(26), eadn9660.

Freshwater

World Resources Institute (WRI) (2025) *Aqueduct Water Risk Atlas*. <https://www.wri.org/aqueduct> (Accessed on 12 March 2025.)

Biodiversity

Pigot, A.L., Merow, C., Wilson, A. et al. (2023). Abrupt expansion of climate change risks for species globally. *Nat Ecol Evol* 7, 1060–1071. <https://doi.org/10.1038/s41559-023-02070-4>

Forests

See above cited Global Forest Watch (GFW) references: Harris et al. (2021) ; Gibbs et al. (2025) ; Hansen et al. (2013); Sims et al. (2025); Tyukavina et al. (2022)

Projections in 2100

Pigot, A.L., Merow, C., Wilson, A. et al. (2023). Abrupt expansion of climate change risks for species globally. *Nat Ecol Evol* 7, 1060–1071. <https://doi.org/10.1038/s41559-023-02070-4>

Zekollari, H., Huss, M., Schuster, L., Maussion, F., Rounce, D. R., Aguayo, R., ... & Farinotti, D. (2024). Twenty-first century global glacier evolution under CMIP6 scenarios and the role of glacier-specific observations. *The Cryosphere*, 18(11), 5045-5066.

Ravinandrasana, V. P., & Franzke, C. L. (2025). The first emergence of unprecedented global water scarcity in the Anthropocene. *Nature Communications*, 16(1), 8281.

Liu, J., Li, D., Chen, H., Wang, H., Wada, Y., Kumm, M., ... & Ciais, P. (2024). Timing the first emergence and disappearance of global water scarcity. *Nature Communications*, 15(1), 7129.

Mellin, C., Brown, S., Cantin, N., Klein-Salas, E., Mouillot, D., Heron, S. F., & Fordham, D. A. (2024). Cumulative risk of future bleaching for the world's coral reefs. *Science Advances*, 10(26), eadn9660.

PATHWAYS FOR ACTION: 1. SCALING-UP ECOLOGICAL RESTORATION AND SUSTAINABLE USE

Degraded ecosystems / Biodiversity Intactness Index (BII)

Schipper, A. M., Hilbers, J. P., Meijer, J. R., Antão, L. H., Benítez-López, A., de Jonge, M. M., ... & Huijbregts, M. A. (2020). Projecting terrestrial biodiversity intactness with GLOBIO 4. *Global change biology*, 26(2), 760-771.

Newbold, T., Hudson, L. N., Arnell, A. P., Contu, S., De Palma, A., Ferrier, S., ... & Purvis, A. (2016). Has land use pushed terrestrial biodiversity beyond the planetary boundary? A global assessment. *Science*, 353(6296), 288-291.

Sustainable land use biodiversity gains

Pereira, H. M., Martins, I. S., Rosa, I. M., Kim, H., Leadley, P., Popp, A., ... & Alkemade, R. (2024). Global trends and scenarios for terrestrial biodiversity and ecosystem services from 1900 to 2050. *Science*, 384(6694), 458-465.

Restoration – Historical forest landscapes

Fesenmyer, K. A., Poor, E. E., Terasaki Hart, D. E., Veldman, J. W., Fleischman, F., Choksi, P., ... & Cook-Patton, S. C. (2025). Addressing critiques refines global estimates of reforestation potential for climate change mitigation. *Nature communications*, 16(1), 4572.

Restoration – Low-yield and degraded cropland and pastures

Strassburg, B. B., Iribarrem, A., Beyer, H. L., Cordeiro, C. L., Crouzeilles, R., Jakovac, C. C., ... & Visconti, P. (2020). Global priority areas for ecosystem restoration. *Nature*, 586(7831), 724-729.

PATHWAYS FOR ACTION: 2. ADVANCING INTEGRATED MANAGEMENT AND TRANSBOUNDARY COOPERATION

Protected areas

IUCN and UNEP-WCMC (2025), The World Database on Protected Areas (WDPA) [On-line], [August 2025], Cambridge, UK: UNEP-WCMC. Available at: www.protectedplanet.net.

PATHWAYS FOR ACTION: 3. MOBILIZING UNESCO-DESIGNATED SITES FOR POLICY IMPLEMENTATION

UN Conventions

Convention on Biological Diversity (CBD. (various years). National Biodiversity Strategies and Action Plans (NBSAPs). <https://www.cbd.int/nbsap/>

Convention on Biological Diversity (CBD. (various years). Sixth National Reports. <https://www.cbd.int/reports/>

United Nations Framework Convention on Climate Change (UNFCCC). (various years). Nationally Determined Contributions (NDCs). <https://www4.unfccc.int/sites/NDCStaging/>

PATHWAYS FOR ACTION: 4. ENHANCING UNESCO-DESIGNATED SITES AS SCIENCE, KNOWLEDGE, AND EDUCATION HUBS

Mountain observatories

GEO Mountains (2025). Inventory of in situ mountain observational infrastructure, v3.0. DOI: 10.5281/zenodo.17020536

Sea Level Monitoring Station Facility

<https://www.ioc-sealevelmonitoring.org/>

TECHNICAL CONTRIBUTORS

Laboratory / Institution(s):



Yale Center for Biodiversity
and Global Change

Yale Center for Biodiversity and
Global Change / Map Of Life



International Centre on Space
Technologies for Natural and Cultural
Heritage under the Auspices of UNESCO



University of Alaska,
Fairbanks / LEGOS



Vrije Universiteit Brussel
Department of Water and Climate, Vrije Universiteit Brussel,
Brussels, Belgium
Laboratory of Hydraulics, Hydrology and Glaciology (VAW),
ETH Zürich, Zürich, Switzerland
Laboratoire de Glaciologie, Université libre de Bruxelles,
Brussels, Belgium



University of Innsbruck;
Mountain Competence Center



Global Forest Watch



International Institute for
Sustainability



WWF Biodiversity Risk Filter



Ecologie, Systematique &
Evolution lab (UMR 8079)



Biosfera
FIU
CEAB



iDiv and Martin Luther University
Halle-Wittenberg ; PBL Netherlands
Environmental Assessment Agency



Eversource Energy Center and
Department of Ecology and
Evolutionary Biology, University of
Connecticut ; Centre for Biodiversity
and Environment Research, University
College London ; Department of
Geography, University at Buffalo ;
African Climate and Development
Initiative, University of Cape Town



Naturebase



Ocean Biodiversity
Information System (OBIS)



Institute of Zoology, Zoological
Society of London



Aqueduct



UNESCO Chair on
Observation and Education
of World Heritage and
Biosphere Reserve

RELEVANT UNESCO FRAMEWORKS, PROGRAMMES AND RESOURCES

UNESCO's wide range of normative instruments, global programmes and site-based designations provides an integrated framework to address the interconnected challenges of biodiversity loss, climate change and sustainable development. These resources help support the safeguarding of cultural, natural and geological heritage, the conservation of biodiversity, and climate action across sites.

UNESCO CONVENTIONS, DESIGNATIONS AND PROGRAMMES

World Heritage Convention (1972)

<https://whc.unesco.org>

Man and the Biosphere Programme (MAB)

<https://www.unesco.org/en/mab>

International Geosciences and Geoparks Programme (IGGP)

<https://www.unesco.org/en/igpp>

Intangible Cultural Heritage Convention (2003)

<https://ich.unesco.org>

Intergovernmental Oceanographic Commission of UNESCO (IOC)

<https://www.unesco.org/en/ioc>

Education for Sustainable Development (ESD)

<https://www.unesco.org/en/education-sustainable-development>

Disaster Risk Reduction Unit

<https://whc.unesco.org/en/disaster-risk-reduction/>

Local and Indigenous Knowledge Systems (LINKS)

<https://www.unesco.org/en/links>

Intergovernmental Hydrological Programme

<https://www.unesco.org/en/ihp>

UNESCO POLICIES, STRATEGIES AND GUIDELINES RELEVANT TO DESIGNATIONS (SELECTED)

Operational Guidelines for the Implementation of the World Heritage Convention (latest version, 2025)

<https://whc.unesco.org/en/guidelines/>

Policy Document on Climate Action for World Heritage (2023)

<https://whc.unesco.org/en/climatechange/>

Policy for the Integration of a Sustainable Development Perspective into the Processes of the World Heritage Convention

<https://whc.unesco.org/en/sustainabledevelopment/>

Statutory framework of the World Network of Biosphere Reserves (2020)

<https://unesdoc.unesco.org/ark:/48223/pf0000373378>

Hangzhou Strategic Action Plan for the UNESCO's Man and the Biosphere (MAB) programme and World Network of Biosphere Reserves (2026-2035)

<https://unesdoc.unesco.org/ark:/48223/pf0000396262>

Technical Guidelines for Biosphere Reserves (2022)

<https://unesdoc.unesco.org/ark:/48223/pf0000375692>

Operational Guidelines for UNESCO Global Geoparks

<https://unesdoc.unesco.org/ark:/48223/pf0000260675>

Berlin Declaration on Education for Sustainable Development: Learning for our planet – Act for sustainability (2021)

<https://unesdoc.unesco.org/ark:/48223/pf0000381228>

Framework for the implementation of Education for Sustainable Development (ESD) beyond 2019 (2019)

<https://unesdoc.unesco.org/ark:/48223/pf0000370215>

Education for Sustainable Development: A Roadmap (2020)

<https://unesdoc.unesco.org/ark:/48223/pf0000374802>

UNESCO DIGITAL DATA PLATFORMS FOR SITES AND BIODIVERSITY**UNESCO Sites Navigator**

<https://www.unesco.org/en/lists-designations/site-navigator>

Ocean Biodiversity Information System (OBIS)

<https://obis.org>

PAST UNESCO PUBLICATIONS (SELECTED)**Indigenous Knowledge, Ancestral Places: Navigating Change in UNESCO Designated Sites (2025)**

<https://unesdoc.unesco.org/ark:/48223/pf0000395661>

UNESCO sites as partners for education for sustainable development: an implementation guide (2025)

<https://unesdoc.unesco.org/ark:/48223/pf0000393024>

Culture and climate action: from margins to mainstream (2025)

<https://unesdoc.unesco.org/ark:/48223/pf0000395681>

Climate change in Mediterranean World Heritage cities (2025)

<https://unesdoc.unesco.org/ark:/48223/pf0000394251>

Pathways for Peace with Nature: Achieving Global Biodiversity Goals in UNESCO Designated Sites, Latin America and the Caribbean (2024)

<https://unesdoc.unesco.org/ark:/48223/pf0000391707>

World Heritage: A unique contribution to biodiversity conservation (2023)

<https://unesdoc.unesco.org/ark:/48223/pf0000376113>

World Heritage Glaciers: Sentinels of climate change (2022)

<https://unesdoc.unesco.org/ark:/48223/pf0000383551>

World Heritage forests: Carbon sinks under pressure (2021)

<https://unesdoc.unesco.org/ark:/48223/pf0000379527>

UNESCO Marine World Heritage: Custodians of the globe's blue carbon assets (2021)

<https://unesdoc.unesco.org/ark:/48223/pf0000375565>

Indigenous knowledge for climate change adaptation (2016)

<https://unesdoc.unesco.org/ark:/48223/pf0000265504>



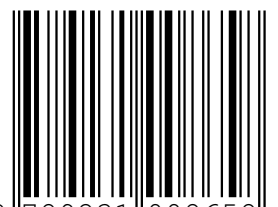
unesco

PEOPLE AND NATURE IN UNESCO-DESIGNATED SITES

Global and local contributions

Building on collaboration among more than 20 leading research institutions, this report compiles data from all UNESCO-designated sites to assess their contributions to climate stability, human well-being, and biodiversity conservation. It also explores their role in sustaining livelihoods, cultural values, and the Indigenous and local knowledge rooted within these landscapes.

The report delivers the first global assessment of over 2,260 World Heritage Sites, Biosphere Reserves, and Global Geoparks—a network covering an area larger than China and India combined and supporting around 10% of the world's population in over 175 countries. Titled *People and Nature in UNESCO-designated sites: Global and local contributions*, it offers the most comprehensive analysis to date of their contributions to people and nature, as well as the growing pressures they face.



9 789231 008658