GREEN PARTICIPATION GREEN EUROPE

A3 – Biodiversity in Action Against Climate Change

HANDBOOK

PROJECT NUMBER : 2023-2-TR01-KA154-YOU-000168735

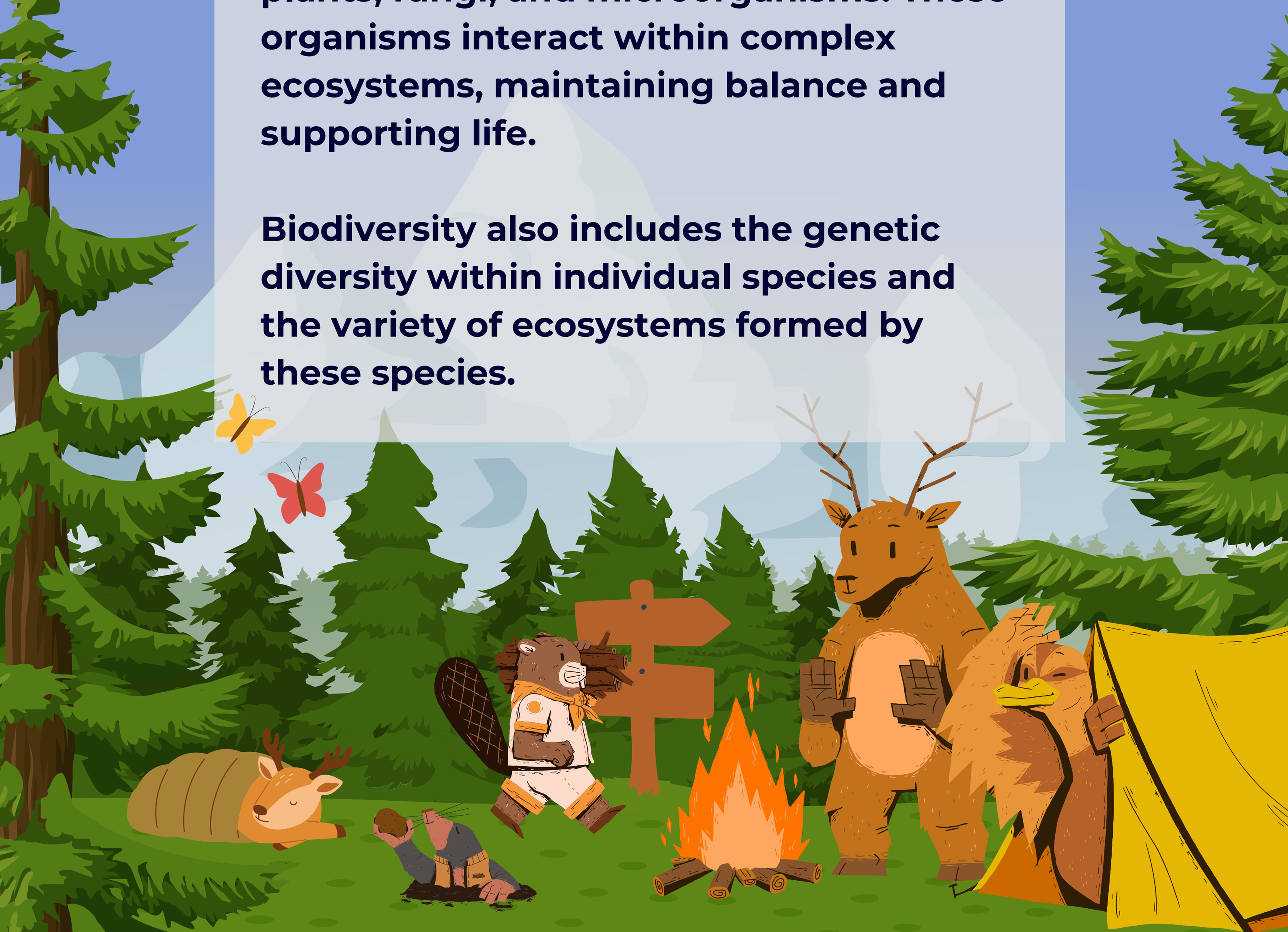
BIODIVERSITY

What is it?

Biodiversity refers to the variety of life forms across different ecosystems, including terrestrial, marine, and desert environments.

It encompasses organisms like animals, plants, fungi, and microorganisms. These organisms interact within complex ecosystems, maintaining balance and supporting life.

Biodiversity also includes the genetic diversity within individual species and the variety of ecosystems formed by these species.



FACTS ON BIODIVERSITY

1. Researchers estimate that there are between 3 and 30 million species on Earth, with some studies suggesting that the number could exceed 100 million species.

2. Currently, only 1.7 million species have been identified, indicating that we have a long way to go before we can accurately determine the total number of species on the planet.

3. Biodiversity is greater in tropical ecosystems compared to temperate or boreal ecosystems. In fact, tropical rainforests are recognized as having the highest levels of diversity.

Species Diversity

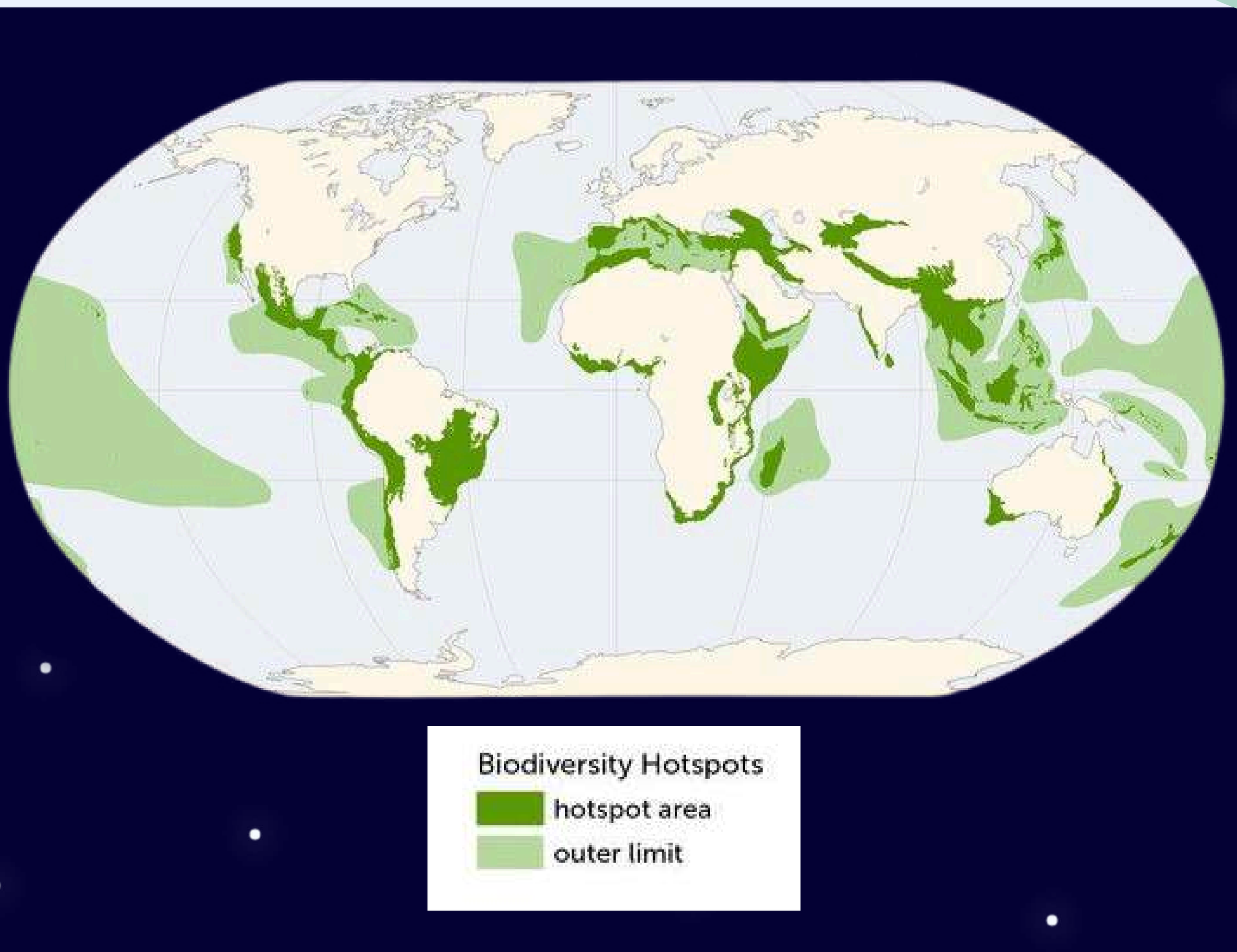
Species diversity refers to the variety of different species present in a specific area, along with their relative abundance. This area could be a habitat, a biome, or even the entire biosphere.

Biodiversity tends to peak in tropical areas near the equator, where a greater diversity and density of life can be found. These regions are often referred to as biodiversity hotspots.

Biodiversity Hotspots

- To help address the significant challenge of species protection, several biologically rich yet threatened regions that host a high number of endemic species have been identified and mapped.

- These "hot spots" of biodiversity have been identified to aid governments and nongovernmental organizations in establishing conservation priorities.



Genetic Diversity

Genetic diversity refers to the biological variation within species, enabling them to adapt to changing environmental conditions.



Examples of Genetic Diversity

- **Dog breeds:** Different breeds of dogs, such as Labradors, Beagles, and Poodles, show genetic variation within a single species (Canis lupus familiaris).



- **Crop varieties:** In agriculture, different varieties of crops like wheat, rice, and corn exhibit genetic diversity that enhances traits like disease resistance, drought tolerance, and yield.



Ecosystem Diversity

Ecosystem diversity refers to the variety of habitats, living communities, and ecological processes within a specific geographic area.



Examples of ecosystems that are rich in diversity:

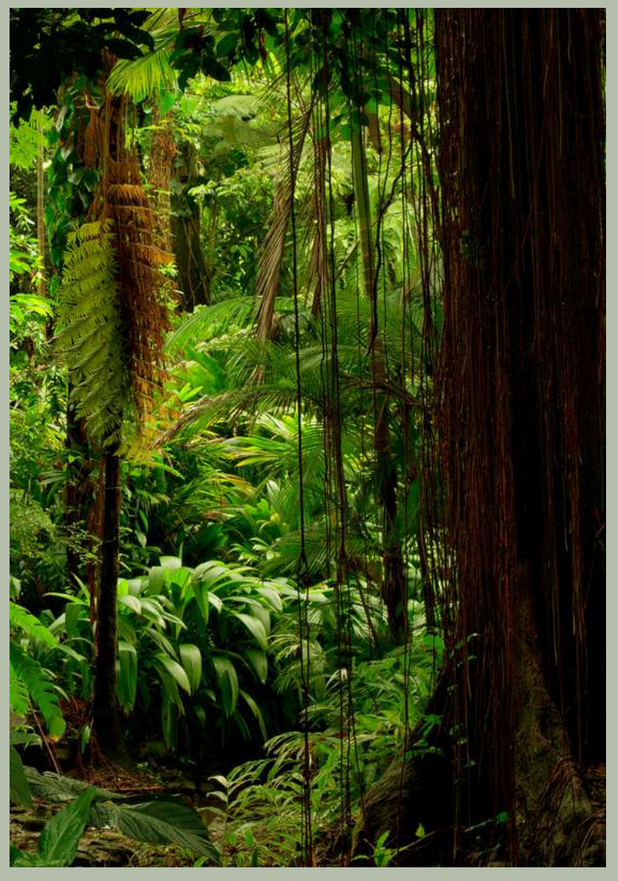
- **Tropical Rainforests:** They contain half of the world's species, including approximately 5-10 million insect species.



- **Coral Reefs:** The Great Barrier Reef in Australia is the world's largest coral reef, spanning 349,000 km². Although it covers just 0.1% of the ocean, it is home to about 8% of the world's fish species, with thousands more yet to be discovered and described.









United Nations
Climate Change

4%

of mammals
losing half their
habitat

+1.5°C

8%

of mammals
losing half their
habitat

+2°C

41%

of mammals
losing half their
habitat

+3°C



LOSING BIODIVERSITY



CORAL REEFS

EVERY FRACTION OF
A DEGREE MATTERS



URCE | IPCC

+ 1.5° C

70 to 90% of coral reefs will vanish



RCE | IPCC

+ 2° C

99% of coral reefs will vanish



OURCE | IPCC

LOSING BIODIVERSITY

Losing biodiversity poses several critical issues:

Climate Issue: Degradation of ecosystems and soils accelerates global warming, while restoring nature helps mitigate climate change.

Business Issue: Natural capital is essential for providing resources for industry and agriculture.

Security and Safety Issue: The depletion of natural resources, particularly in developing countries, can lead to conflicts and increased vulnerability to natural disasters.

Food Security Issue: Biodiversity, including plants, animals, pollinators, and soil organisms, is vital for our food systems.

Health Issue: Environmental destruction heightens the risk of diseases and reduces resilience. Additionally, nature positively impacts mental health and well-being.

How serious is the problem of biodiversity loss?

Over the past 40 years, the global population of wild species has declined by 60% due to unsustainable human activities. Currently, around 1 million species are at risk of extinction within the next few decades. **The main drivers of this decline include:**



Conversion of Natural Habitats:

Conversion of ecosystems into agricultural land and urban areas.

Overexploitation of Natural Resources:

Practices like overfishing and harmful farming methods.

Climate Change:

Changes in climate patterns impacting ecosystems and species.

Pollution:

Contamination of air, water, and soil impacting wildlife.

Invasive Alien Species:

The introduction of non-native species that disrupt local ecosystems.



THE RELATIONSHIP BETWEEN BIODIVERSITY AND CLIMATE CHANGE

Climate change is a key factor in the erosion of biodiversity, while biodiversity loss, in turn, accelerates climate change by reducing the ability of degraded ecosystems to absorb and store CO2. As a result, humanity has a global responsibility to tackle both challenges and address the complex interactions between them.



The Importance of Biodiversity in Combating Climate Change and Environmental Degradation

When human activities release greenhouse gases, roughly half of these emissions remain in the atmosphere, while the other half is absorbed by land and ocean ecosystems. These ecosystems, supported by biodiversity, function as natural carbon sinks, providing essential nature-based solutions to address climate change.

“Climate change is a primary driver of biodiversity loss. And climate change depends on biodiversity as part of the solution. So clearly the two are linked, and cannot be separated.”

-Elizabeth Mrema, Executive Secretary, United Nations Convention on Biological Diversity



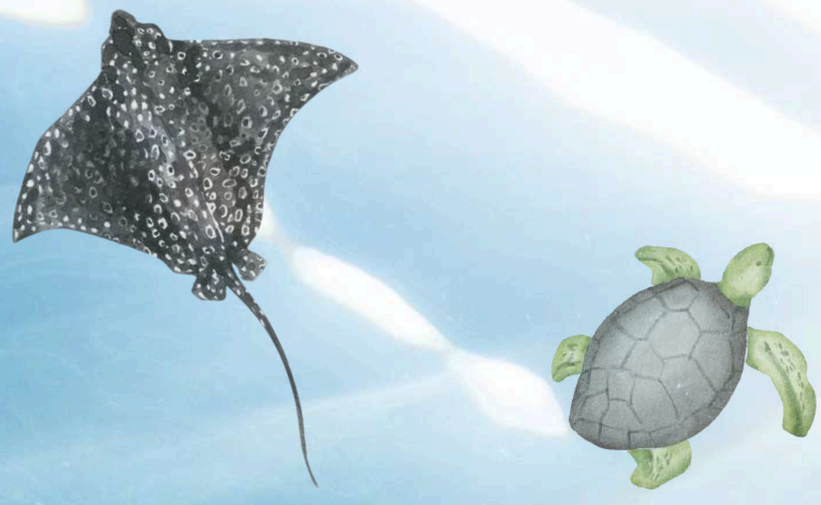
SOLUTIONS

Combat Climate Change: Lowering greenhouse gas emissions to reduce the impacts of climate change on biodiversity.

Sustainable agriculture and forestry: Encouraging farming practices that minimize habitat destruction, soil degradation, and deforestation.

Reduce Pollution: Minimizing pollutants like plastic waste, pesticides, and fertilizers that negatively impact ecosystems and wildlife.

Conservation Policies: Enhancing legislation to safeguard endangered species and ecosystems.

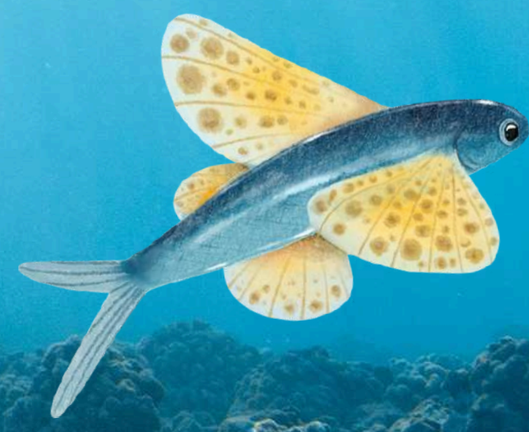


Habitat protection and restoration: Protecting and preserving vital habitats such as forests, wetlands, and coral reefs, while restoring degraded ecosystems.

Education and awareness: Raising public awareness about biodiversity loss and promoting community engagement in conservation efforts.



















WHAT CAN YOU DO?

Individuals can make a difference

YOU CAN...

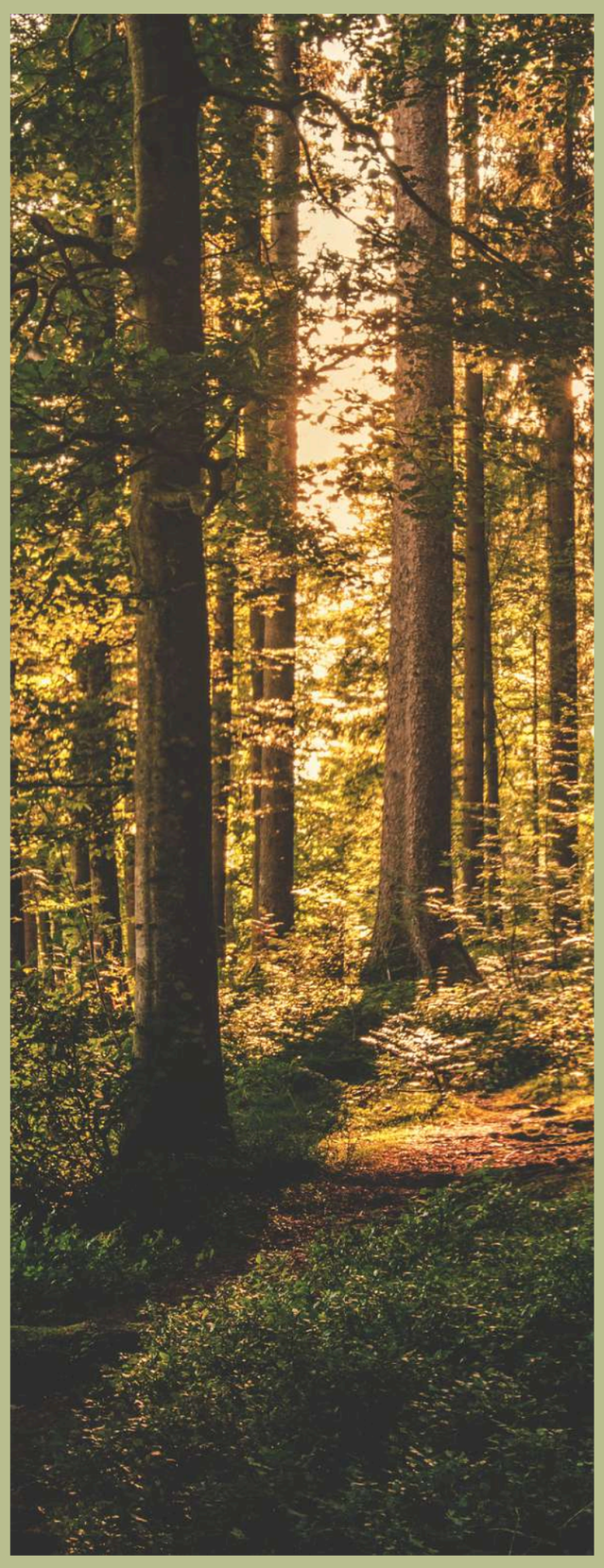
Support political initiatives focused on protecting and restoring biodiversity

Support organizations that advocate for the protection and restoration of biodiversity

Recycle

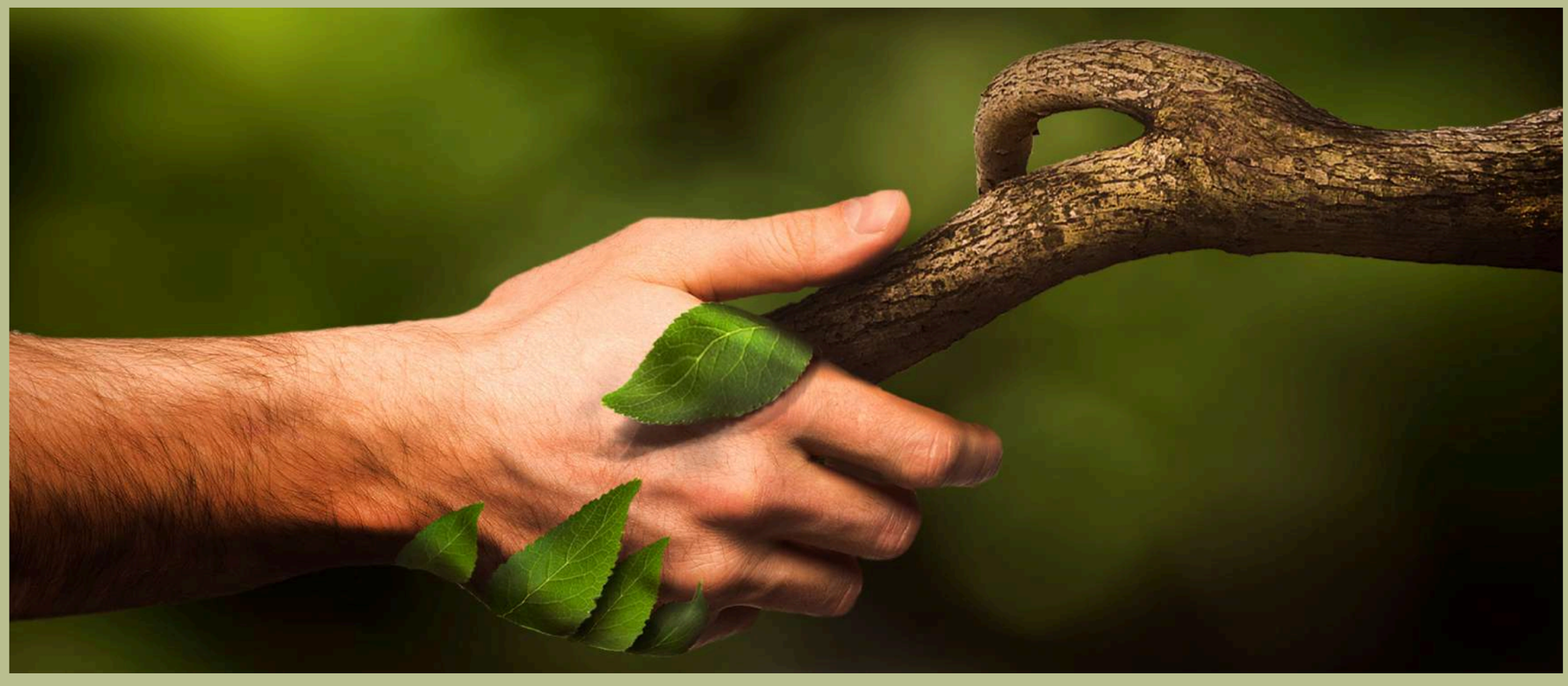
Substitute products with sustainable and environmentally-friendly alternatives

The EU Biodiversity Strategy for 2030



As part of the **European Green Deal**, the EU Biodiversity Strategy for 2030 aims to restore biodiversity across Europe by 2030 through ambitious actions, such as protecting at least 30% of the EU's land and sea areas, restoring degraded ecosystems, and reducing pollution.

The Strategy also proposes the **EU Nature Restoration Plan** that aims to restore ecosystems, improve habitat and species conservation, reduce pesticide and fertilizer use, boost organic farming, and address biodiversity loss.



Other EU policies to protect biodiversity

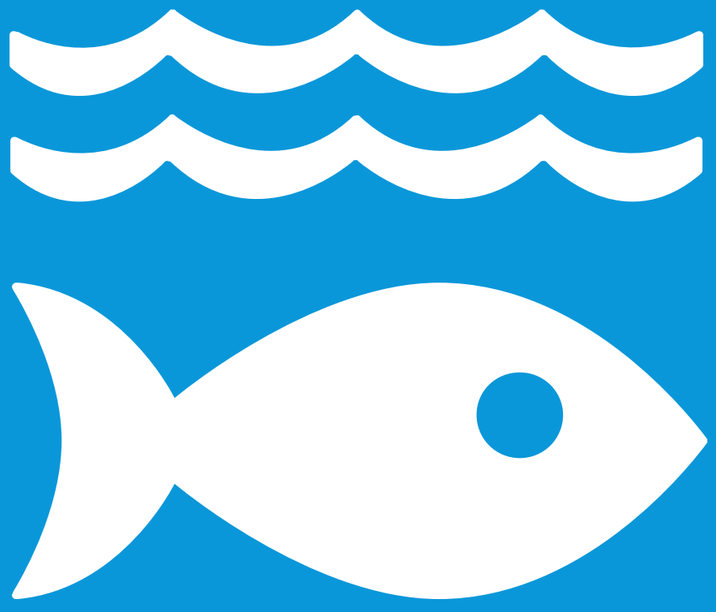
- **Birds directives:** It aims to protect all naturally occurring wild bird species in the EU and their essential habitats.



- **Habitats directives:** It aims to protect more than a thousand species, including mammals, reptiles, amphibians, fish, invertebrates, and plants, as well as 230 distinct habitat types.



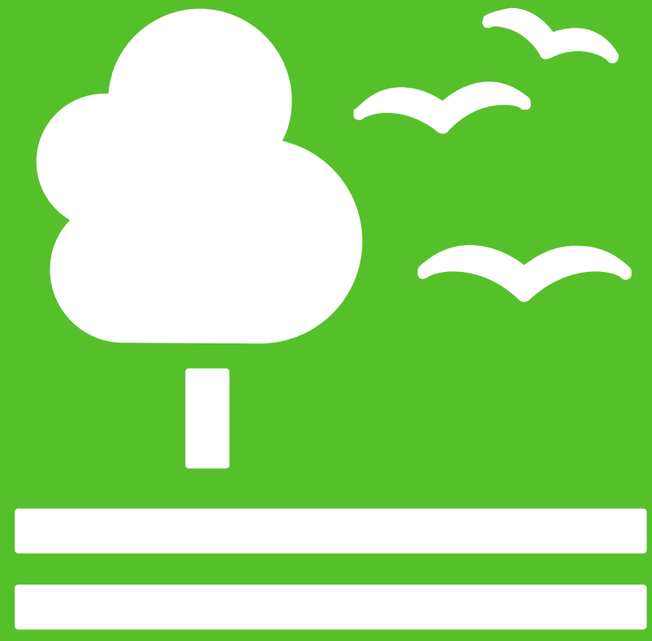
GOAL 14 LIFE BELOW WATER



KEY TARGETS

- End overfishing and restore fish stocks.
- Safeguard at least 10% of coastal and marine areas.
- Implement international law, as outlined by the UNCLOS, to guarantee the sustainable conservation and utilization of ocean resources.
- Reduce marine pollution, particularly from land-based sources.

GOAL 15 LIFE ON LAND



KEY TARGETS

- Reduce habitat degradation, halt biodiversity loss, and protect endangered species.
- Prevent and mitigate the impacts of invasive alien species.
- Conserve mountain ecosystems including their biodiversity.
- Promote sustainable forest management and stop deforestation.

REFERENCES

[1] BYJU'S. (2020). What Is Biodiversity? - Definition, Types And Importance,. BYJUS. https://byjus.com/biology/biodiversity/

[2] Hancock, L. (2024). What is biodiversity and why is it under threat? World Wildlife Fund. https://www.worldwildlife.org/pages/what-is-biodiversity

[3] The National Wildlife Federation. (2019). Biodiversity | National Wildlife Federation. National Wildlife Federation. https://www.nwf.org/Educational-Resources/Wildlife-Guide/Understanding-Conservation/Biodiversity

[4]University of Gothenburg. (2020, October 19). This is genetic biodiversity | University of Gothenburg. Www.gu.se. https://www.gu.se/en/cemeb-marine-evolutionary-biology/management-conservation/baltgene/this-is-genetic-biodiversity

[5] Lindwall, C. (2022, April 22). Biodiversity 101. Www.nrdc.org. https://www.nrdc.org/stories/biodiversity-101

[6] New England Primate Conservancy. (2023, May 16). BIODIVERSITY: Ecosystem Diversity - New England Primate Conservancy. Neprimateconservancy.org. https://neprimateconservancy.org/biodiversity-ecosystem-diversity/

[7] Kagaruki, T. (2021). Species Diversity: Definition, Importance, Examples, Threats, Conservation. BYJUS. https://byjus.com/neet/why-is-species-diversity-important/

[8] United Nations. (2022). Biodiversity - Our Strongest Natural Defense against Climate Change. United Nations. https://www.un.org/en/climatechange/science/climate-issues/biodiversity

[9] UNESCO. (2023). Biodiversity and climate change | UNESCO. Www.unesco.org. https://www.unesco.org/en/climate-change/biodiversity

[10] The Royal Society. (2024). How can you protect biodiversity? | Royal Society. Royalsociety.org. https://royalsociety.org/news-resources/projects/biodiversity/how-can-you-protect-biodiversity/

[11] European Commission. (2020). Biodiversity Strategy for 2030. Environment.ec.europa.eu; European Commission. https://environment.ec.europa.eu/strategy/biodiversity-strategy-2030_en

[12] United Nations. (2024). The 17 sustainable development goals. United Nations. https://sdgs.un.org/goals

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