IUCN Policy brief
October 2024

Ecosystems
in the Global Biodiversity Framework

Summary

- → Ecosystems are vital for life and are a prominent aspect of the Global Biodiversity Framework, which aims to protect and restore biodiversity.
- → If countries use a consistent approach to report on ecosystems, a global understanding about the state and trajectory of ecosystems can emerge.
- → The Global Ecosystem Typology provides a consistent system for classifying ecosystem types that is comparable across countries.
- → The Red List of Ecosystems is a global standard for assessing risk of ecosystem collapse. It is a headline indicator for the Global Biodiversity Framework, with countries to report on the number of ecosystems per risk category.
- → Ecosystem data provide foundational information for meeting Global Biodiversity Framework targets for biodiversity-inclusive spatial planning (Target 1), restoration (Target 2) and protection (Target 3).

THE BIODIVERSITY PLAN
For Life on Earth

The Kunming-Montreal Global Biodiversity Framework sets out an ambitious pathway to reach the global vision of a world living in harmony with nature by 2050. It comprises four goals for 2050 and 23 action targets for 2030.[1] The Global Biodiversity Framework will help the nations of the world to work together to protect and restore biodiversity, so that people can prosper with nature.

> **Ecosystems** are a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.[2] They are made up of living components, the abiotic environment, and interactions within and between them.

Ecosystems feature prominently across the goals and targets of the Global Biodiversity Framework. This is because ecosystems play an essential role in sustaining biodiversity and the ecosystem services that support human well-being and the economy.

The Global Biodiversity Framework seeks to increase the area, and enhance the integrity, connectivity and resilience of ecosystems (Goal A), and to ensure the sustainability of the benefits that ecosystems provide to people (Goal B). It does this through protection (Target 3), restoration (Target 2) and reducing threats (Targets 1, 5, 6, 7, 8).

The monitoring framework of the Global Biodiversity Framework sets headline indicators to track progress towards the goals and targets.[3] It has five headline indicators that relate directly to ecosystems:

- → Red List of Ecosystems (A1)
- → Extent of natural ecosystems (A2)
- → Services provided by ecosystems (B1)
- → Area under restoration (2.1)
- → Coverage of protected areas and other effective conservation measures (3.1)

Alexia Francois via Unsplash

A consistent approach for ecosystems

If reported consistently, the ecosystem-related indicators provide a well-rounded picture of efforts to conserve ecosystems. For a given ecosystem group, like kelp forests, coral reefs or tropical rainforests, a country gains an overview of how threatened they are (A.1), how much still exists (A.2), which services they provide (B.1), how much is protected (3.1) and is being restored (2.1).

The **IUCN Red List of Ecosystems** and **IUCN Global Ecosystem Typology** provide consistency for implementing and monitoring the goals and targets of the Global Biodiversity Framework. They are accepted international standards that help countries compile ecosystem information in a way that makes the assessments, underlying data and indicators comparable between countries.

They provide consistent:

- → Theory and definitions for complex concepts and terms.
- → Approaches to compile practical data, descriptions and maps of ecosystems.
- → Standards to assess risk using the same categories and criteria.
- → Focus for collaboration, cooperation and knowledge sharing.

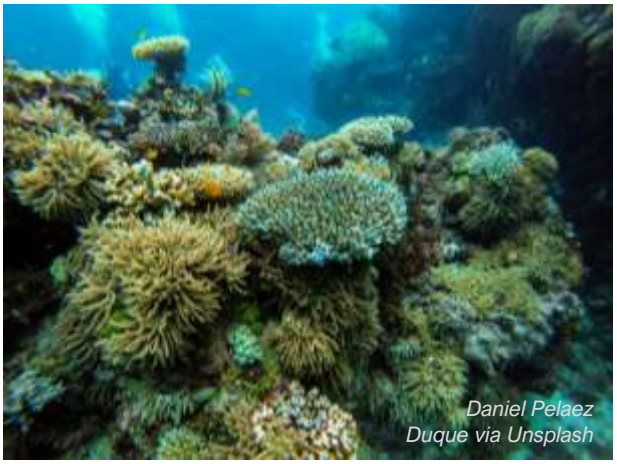
If all countries use a similar approach to report on ecosystems, then a global understanding about the state and trajectory of ecosystems can be built-up from national data. For example, recent Red List of Ecosystems assessments in Colombia[4], Myanmar[8] and Mozambique reveal that tropical dry forest ecosystems are threatened across the world.

The IUCN Global Ecosystem Typology

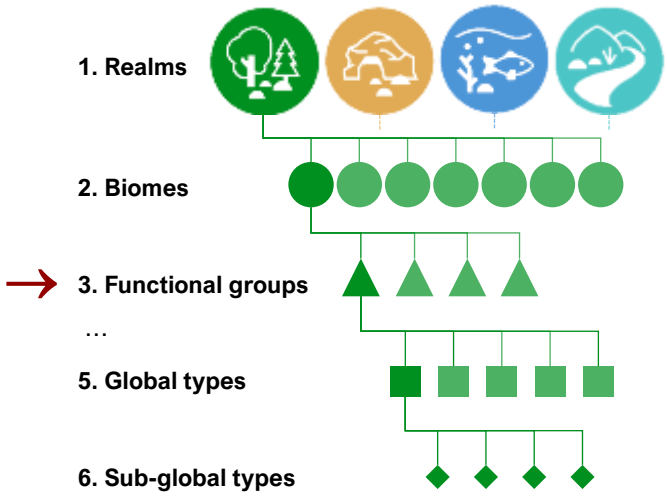
The Global Ecosystem Typology is a system for classifying ecosystem types.[4] It has been adopted as an international standard by IUCN and the United Nations Statistics Commission.

> **Ecosystem types** are differentiated from one another by a degree of uniqueness in composition, structure and function. Ecosystem types can be identified, classified and described using the IUCN Global Ecosystem Typology.

https://global-ecosystems.org/



Daniel Pelaez Duque via Unsplash



The Global Ecosystem Typology covers all realms (terrestrial, marine, subterranean and freshwater), including natural and anthropogenic ecosystems. The typology is hierarchical, with similar functional characteristics at the upper levels, and similar biodiversity composition at lower levels.

The typology does not replace national classifications and maps. National classifications are at the lower levels of the hierarchy, usually level 5-6 (e.g. Colombia[5], Finland[6], South Africa[7] and Myanmar[8]). These remain the foundation for the Global Biodiversity Framework targets. Instead, the Global Ecosystem Typology helps to group similar ecosystems described in different (e.g. national) ecosystem classifications, by aligning them to the ecosystem functional group (level 3) of the typology. This allows consistent comparisons of ecosystem diversity across the world based on national data.

Global ecosystem types can also be approximated by dividing ecosystem functional types by ecoregions, to make level 4 of the hierarchy (not shown in the figure above).

Reporting using the Global Ecosystem Typology

The CBD ad-hoc technical expert group on indicators recommends using the Global Ecosystem Typology for consistent reporting on ecosystem-related indicators. Reporting should be done at the level of ecosystem functional groups, to balance detail and complexity with the need to communicate and compare the indicators.

> **Ecosystem functional groups** comprise a group of related ecosystems that share common ecological drivers, traits and features that characterise the group. For example, seagrass meadows in the marine realm, tropical/subtropical lowland rainforests in the terrestrial realm, or artesian springs and oasis in the freshwater realm.

In practice, this means that countries with established ecosystem classifications should cross-reference their ecosystem classification with the typology. For countries with different classifications from multiple sources, the typology can help synthesise these data. For countries with no current ecosystem classifications, the Global Ecosystem Typology can help as a starting point to develop their own national classifications.

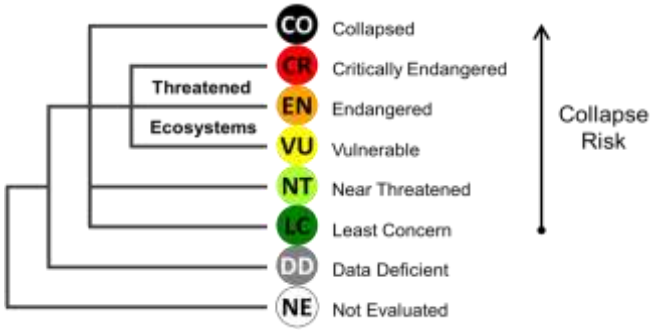
GLOBAL ECOSYSTEMS ATLAS

The typology is a conceptual framework for classifying ecosystems, rather than a mapping tool. A new global initiative, the Global Ecosystems Atlas, seeks to bring together existing high-quality maps of ecosystem types and align them with ecosystem functional groups.

The IUCN Red List of Ecosystems

RED LIST OF ECOSYSTEMS

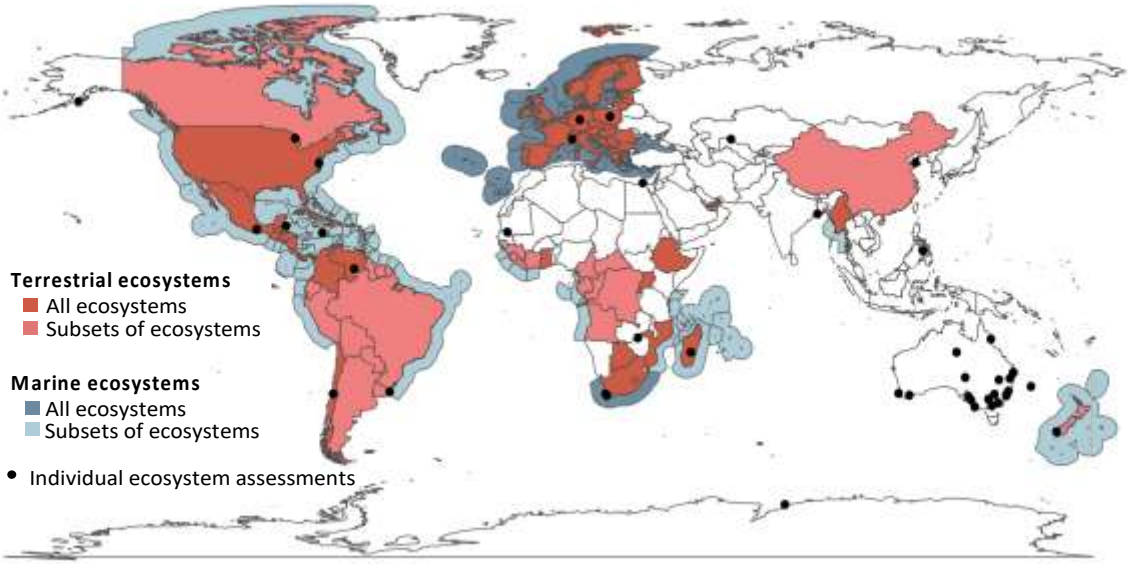
The Red List of Ecosystems was adopted by IUCN in 2014 as the global standard for assessing risk of ecosystem collapse.[9] It is a systematic framework for compiling information on ecosystems and assessing their relative risks of collapse based on change in ecosystem area and integrity. Assessment criteria are used to assign ecosystems to different Red List risk categories.



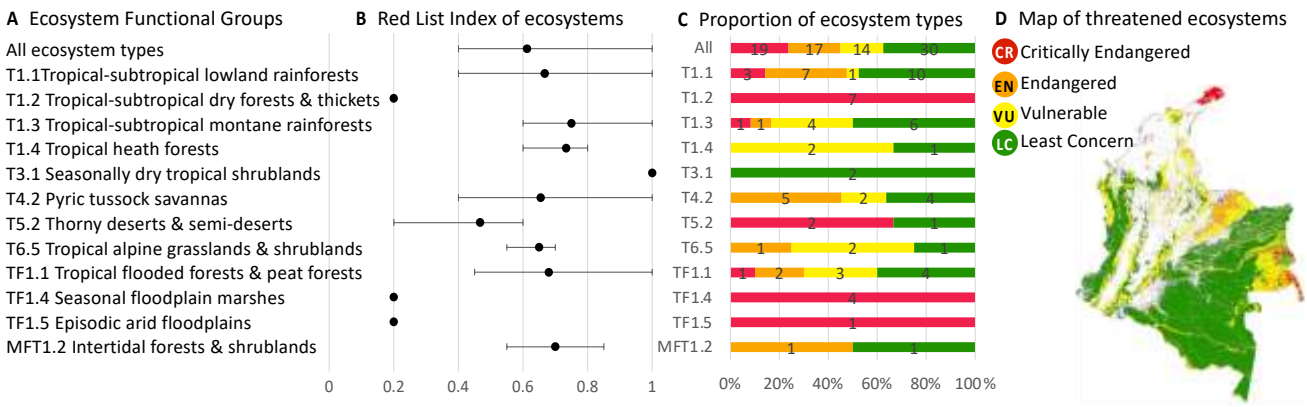
> **Ecosystem collapse** is the endpoint of ecosystem decline, when an ecosystem loses its defining features and is replaced by a different ecosystem type. Collapse can be irreversible, but some ecosystems may recover over long timeframes or with restoration.

https://iucnrle.org/

The new IUCN Red List of Ecosystems Inventory is a repository of ecosystem assessments from around the world.



Current availability of Red List of Ecosystems assessments by country (2024).



The outcomes of the Red List of Ecosystems assessments for Colombia.

Reporting using the Red List of Ecosystems

The Red List of Ecosystems addresses multiple aspects of Goal A, by assessing how change in integrity, connectivity and area affect ecosystem risk status, which is related to ecosystem resilience. For this reason, the Red List of Ecosystems is a headline indicator for Goal A.

Headline indicator A1 Red List of Ecosystems uses the outcomes of Red List of Ecosystems assessments. Ideally, reporting should be based on national data. Countries should report on the number of ecosystem types per risk category in each ecosystem functional group.

These data can be used to calculate the Red List Index of Ecosystems. The index measures the average risk of ecosystem collapse of a group of ecosystems. It ranges from a value of 0 if all ecosystems have collapsed to a value of 1 if all ecosystems are Least Concern. Index values can be compared between countries. For those countries with repeat assessments, it can be shown as a time-series.

The Red List of Ecosystems information can be represented in graphs or maps to aid communication and inform spatial planning.

Amalia Peigneux via Unsplash

Conclusion

The science of ecosystem classification, mapping and assessment has leapt forward over the last decade. The Red List of Ecosystems is well-placed to aid Parties as they assess, plan and act to achieve the targets and goals.[10]

The biggest challenge lies in increasing coverage of assessments. This will require commitment and investment in people, data collection and methods as well as partnerships between practitioners, policymakers, and scientists. Lessons from across Africa, northern Europe and Latin America can help countries target their investment and build capacity.

References

1. CBD. (2022) Kunming-Montreal Global Biodiversity Framework (CBD/COP/DEC/15/4).
2. CBD. Article 2.
3. CBD. (2022) Monitoring framework for the Kunming-Montreal Global Biodiversity Framework (CBD/COP/DEC/15/5).
4. Keith et al. (2022) A function-based typology for Earth's ecosystems. *Nature* 610, 513-518.
5. Etter et al. (2020) Colombian ecosystems, threats and risks. Pontificia Universidad Javeriana and Conservación Internacional-Colombia.
6. Kontula & Raunio (2019) Threatened Habitat Types in Finland 2018. Finnish Environment Institute and Ministry of the Environment.
7. Skowno & Monyeki (2021) South Africa's Red List of Terrestrial Ecosystems. *Land* 10, 1048.
8. Murray et al. (2020) Myanmar's terrestrial ecosystems: Status, threats and conservation opportunities. *Biol Cons* 252, 108834.
9. IUCN (2024). Guidelines for the application of IUCN Red List of Ecosystems Categories and Criteria, Version 2.0. IUCN, Gland, Switzerland.
10. Nicholson et al. (2024) Roles of the Red List of Ecosystems in the Kunming-Montreal Global Biodiversity Framework. *Nature Ecology & Evolution*, 8(4), 614-621.