

## Climate & Sustainability

One metric for carbon,  
many for biodiversity:  
why biodiversity can't be  
captured by a single number



# How can we measure biodiversity?



## Biodiversity metrics can be grouped in three clusters

While for the climate there is only one metric, CO<sub>2</sub>e, **three clusters of metrics** should be considered to assess biodiversity:

### **Ecosystem extent**

It refers to the spatial area and boundaries over which the ecosystem's components, processes and interactions occur (e.g. area of loss, area of gain)

### **Ecosystem condition**

It describes the landscape and site conditions (e.g. ecosystem connectivity, water and soil quality)

### **Species**

It focuses on the species population (e.g. species abundance and extinction risk)

# Two methods can be used to assess each metric in each cluster

## On site

**Survey-based methods** using camera traps, photographic surveys, eDNA sampling, bioacoustics or floristic observations are essential for validating the **actual presence of species, measuring ecological parameters and understanding habitat functionality**



## Remote sensing

**Satellite technology and drones** provide continuous spatial and temporal coverage, useful for **monitoring fragmentation, vegetation cover and land-use changes**



# The four main metrics used to aggregate on-site measurements & monitor biodiversity

## MSA (Mean Species Abundance)

It is one of the leading metrics to assess biodiversity and it is based on the **GLOBIO pressure-impact models**. It is a measure of the abundance of species compared to the reference state, assessed using a standard set of taxonomic groups.

## STAR (Threat Abatement & Restoration)

STAR is a biodiversity metric based on information of the **IUCN Red List of Threatened Species**. The STAR methodology maps range rarity, a measure of the number of species and proportion of their distributions overlapping at a site, weighted by species' threat of extinction risk.

## BII (Biodiversity Intactness Index)

The index uses **abundance data** on plants, fungi and animals to assess how local terrestrial biodiversity responds to human pressures such as land-use change.

## EII (Ecosystem Integrity Index)

The index includes **measures for structure, composition, and function**. The EII is based on modelled and remotely-sensed data.

# Example: how can a timber company measure its impacts on forests?

A company **harvests timber** from forests

**Metrics within each cluster to be used**

**Species abundance** in forest habitats impacted by logging operations

**Hectares of forest area** logged

**Change in:**

- forest habitat intactness
- structural connectivity
- functional connectivity



**Metrics to measure the company's impacts**

Amphibian species richness

Annual harvest area

Canopy cover loss

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