Factsheet

Biodiversity footprinting and accounting

Assessing your organisation's impacts and dependencies: The first step of your ecological transition

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an atos company

Contents

Overview

Biodiversity refers to the set of all natural processes that enable humans and many other living species to live and thrive. It includes a diversity of species, ecosystems, genes and their interactions. These ecosystems provide benefits, such as climate regulation, crop pollination, water purification, flood regulation, etc. These are referred to as "ecosystem services" and are essential for our wellbeing and survival.

Biodiversity loss is increasing, as evidenced by the alarming report on biodiversity decline worldwide published by the Intergovernmental Panel on Biodiversity and Ecosystem Services (IPBES) in 2019. For example, 40% of insects are in decline globally, while at least 75% of food crops in Europe depend on insect pollinators. Across all sectors, human and economic activities depend on ecosystem services. The consequences of biodiversity collapse, which we are already starting to see, are multiple: less drinkable water, lower agricultural yields, increased vulnerability to floods and droughts.

Today, scientists and governments agree on the need to reverse the curve and avoid the worst consequences of biodiversity collapse. This urgency to act is also reflected in the conceptual model of global limits, which describes global thresholds with environmental dimensions that should not be exceeded to maintain the stability of the natural world. As of 2023, six of the nine limits have already been reached, including the limit for biodiversity erosion. Two solutions are available to address this issue: reducing pressures and restoring biodiversity.

At the end of COP 15 in December 2022, the 'Kunming-Montreal' Global Agreement was established to fight global biodiversity loss. The targets of the agreement reflect states' ambitions and commitments to act by 2030. These include a target to encourage companies to regularly monitor, assess and disclose risks, dependencies and impacts on biodiversity. These ambitious targets can only be achieved through deep economic, social, political and technological changes.

In recent years, we have also seen drastic evolutions of regulatory frameworks. The common goal of all these initiatives is to encourage companies to measure and report on biodiversity impacts and dependencies. The EU Sustainable Financial Framework requires improved environmental disclosures, while the European Green Deal encourages the development of corporate natural capital accounting approaches. Private and public stakeholders alike play a key role in preserving biodiversity.

"Given the current limitations of globally standardised methods and the complexity of the subject, we at EcoAct can help you understand, measure and reduce your impacts and dependencies on biodiversity."

Jeanne Barreyre
Research consultant in biodiversity and nature-based solutions at EcoAct

Introduction to biodiversity

Introduction to biodiversity

1. What is biodiversity?

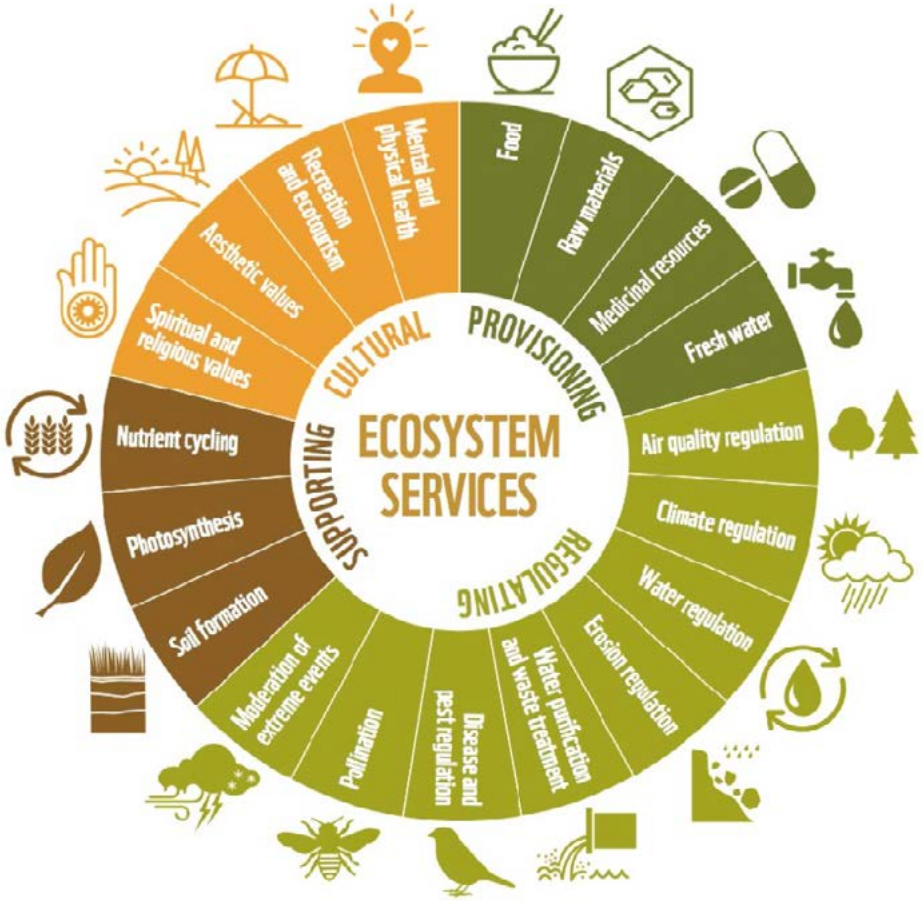

Figure 1. Different ecosystem services categories (WWF, 2016)

Biodiversity

The word "biodiversity" was introduced in the 1980s by E.O. Wilson, a renowned American biologist. He combined the words "biology" and "diversity" to refer to the variety of life forms on Earth. Since then, biodiversity has become a key concept to describe the richness and diversity of life on our planet, encompassing all species, ecosystems, and genes. The concept of biodiversity is essential for understanding the complex relationships between living beings and their environment, as well as the impacts of human activity on our ecosystems.

Biodiversity is important not only to keep ecosystems functioning properly, but also for their resilience, and for human wellbeing and economic prosperity.

Ecosystem services

An ecosystem service is a tangible or intangible benefit that people derive from ecosystems. These services make human life possible by providing food and water, regulating disease and climate, contributing to pollination and soil formation, and providing recreational, cultural and spiritual benefits. Maintaining biodiversity and its services in good condition is therefore essential for human and economic activities. (Figure 1)

Pressures

Human activities cause pressures that directly result in biodiversity loss. These pressures, or direct drivers, have been identified by IPBES and ranked in order of impact (from most to least) (Figure 2):

1. Land and sea use change: Habitat destruction, fragmentation and disruption of ecosystems due to agricultural expansion and urbanisation

2. Direct exploitation of organisms (non-renewable and renewable): Overexploitation of resources provided by nature (e.g. freshwater) and depletion of stocks (e.g. fisheries)

3. Climate change (direct or indirect effects): Whether gradual changes (e.g. sea level rise) or an increase in the frequency and severity of extreme weather events (e.g. floods, droughts)

4. Pollution: Can be plastic, chemical, noise or light pollution, and disrupts natural cycles and ecosystem dynamics

5. Invasive species: Introduced by humans voluntarily or accidentally and whose spread threatens ecosystems, habitats or native species.

Impacts

A biodiversity impact is defined as the change in the state of biodiversity. For example, the impact on an ecosystem refers to its extent, condition or integrity change. Regarding an impact on a species, we can measure population size or habitat evolution. These changes can be positive (biodiversity gain) or negative (biodiversity loss).

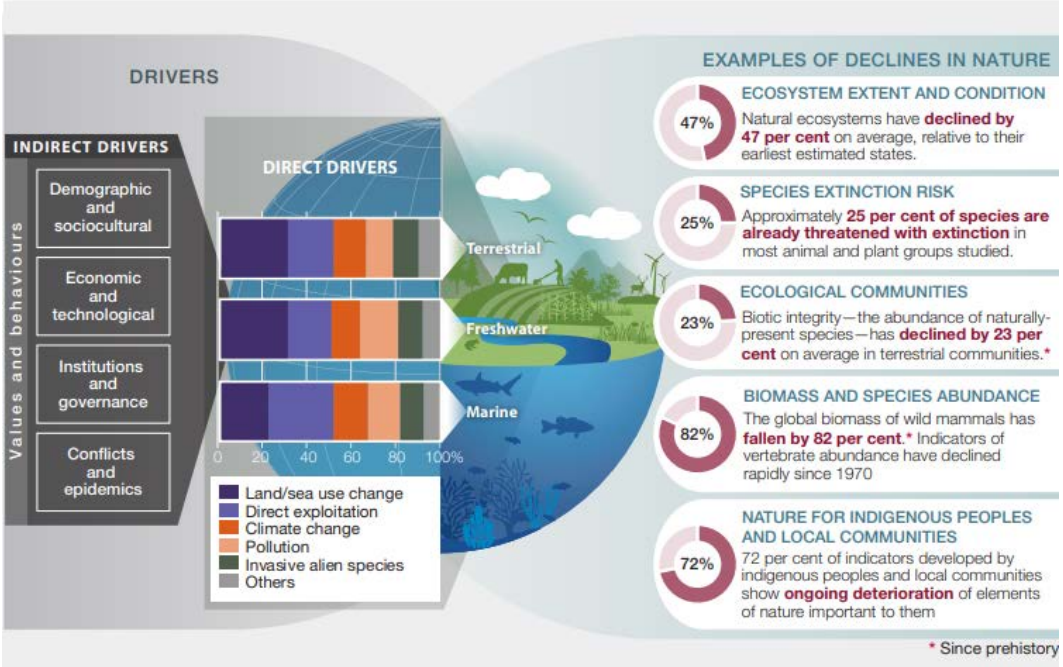

Figure 2. Examples of declines in nature at the global level, highlighting the loss of biodiversity caused by direct and indirect drivers of change (IPBES, 2019)

1.2. Why should businesses care about biodiversity?

Risks and opportunities

Businesses critically depend on ecosystem services to produce goods and services. Therefore, the erosion of biodiversity and the degradation of its services is a big threat for all economic activities. According to the Taskforce on Nature-Related Financial Disclosures (TNFD) organisations face both short-term (financial, reputational, ethical) and long-term risks (competitiveness for their raw materials, dependencies on ecosystem services). It is urgent that companies address these issues. To do so, understanding the origin of the risks linked to the biodiversity global decline is a crucial step to catalysing action.

Anticipating regulation

Today, scientists and governments agree on the need to reverse the collapse curve, and in recent years there has been a dramatic shift in the regulatory landscape. Indeed, new international agreements, frameworks, and targets, as well as national policy and regulatory developments, are constantly emerging.

In France, for example, measuring the ecological footprint of companies will become mandatory under the national biodiversity plan. From a reporting perspective, the Corporate Sustainability Reporting Directive (CSRD) is likely to lead to greater disclosure of biodiversity in the EU. At the global level, the TNFD, inspired by the TCFD, will establish a framework for nature-related risk communication and the Science-Based Targets Network (SBTN) will help companies to set science-based targets for reducing the impact of business activities on biodiversity. And since 2022, CDP has included several mandatory questions on the consideration of biodiversity issues in its climate change questionnaire.

These initiatives and reporting frameworks that have recently emerged have a common goal: To guide private and public stakeholders to take biodiversity issues into account in their activities. Most of these initiatives are based on what exists for the climate, making it easier for stakeholders to understand and act in favour of nature.

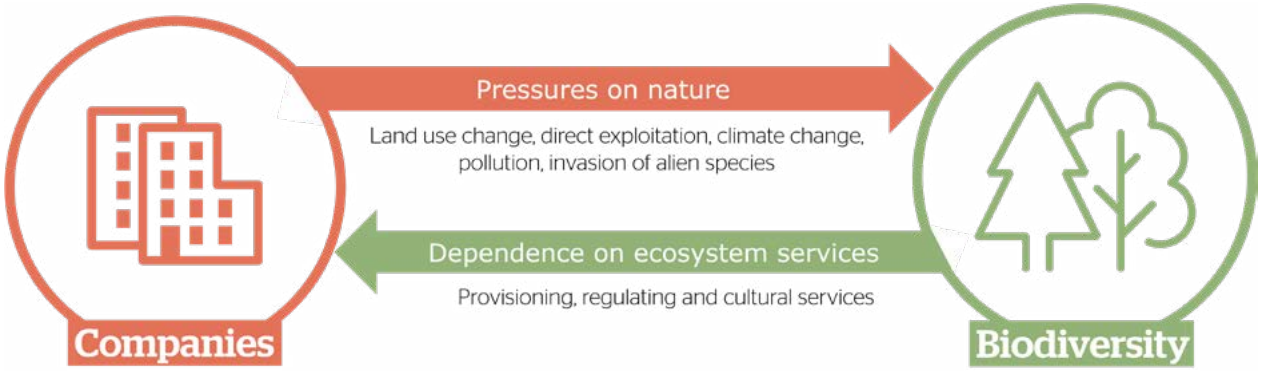

Figure 3: Links between the contribution to pressures on nature and the dependence of economic activities on ecosystem services (EcoAct)

1.3 How can you address the issue within your organisation?

Even if there is no existing standardised tools and methods to analyse the impacts on biodiversity due to the complexity of the topic and ongoing research, private and public stakeholders already have the tools to answer several questions about biodiversity: How do we quantify and reduce our impact on nature? How do we reduce our dependence on the ecosystem services that are most at risk? What actions should be prioritised to ensure our resilience to biodiversity loss? How can we participate in the preservation and restoration of biodiversity?

Measuring your impact on biodiversity

By using the resources provided by nature, economic activities exert pressure on it. The biodiversity footprint makes it possible to quantify your organisation's contribution to these pressures and to estimate their impacts.

To translate the pressures defined by IPBES into impacts in the past, present and future, the Netherlands Environmental Assessment Agency (PBL), in collaboration with the UNEP-WCMC (UN Environment Programme World Conservation Monitoring Centre) and the UNEP GRID-Arendal (UN Environment Programme for Global Resources Information Database), developed the GLOBIO model. The core of the model consists of quantitative relationships between pressures and impacts that have been established based on extensive databases on terrestrial biodiversity. To characterise the impacts, GLOBIO provides results expressed by the Mean Species Abundance (MSA) indicator. It is a biodiversity indicator expressing the average relative abundance of native species in an affected ecosystem compared to their abundance in undisturbed ecosystems. The MSA metric is an indicator of local biodiversity integrity and varies between 0% to 100%.

Understanding dependencies on ecosystem services

A collateral effect of biodiversity erosion is the degradation of ecosystem services. How much do my economic activities depend on these services? How will my activities be affected if the services on which they depend are degraded? How can I mitigate this risk? These are the questions that all organisations should be asking themselves.

To answer these questions, the Exploring Natural Capital Opportunities, Risks and Exposure (ENCORE) tool has been developed by the Natural Capital Finance Alliance in partnership with UNEP-WCMC. It helps to qualify human dependencies on our natural capital and to capture the environmental changes that affect them.

Natural capital represents all renewable and non-renewable natural resources that provide benefits to humans (e.g. plants, animals, air, water animals, water, soil, minerals).

Building on climate knowledge

Most of the emerging initiatives and frameworks mentioned above (SBTN, TNFD, CDP) are based on those that exist for climate.

This is due to the strong complementarities between climate and biodiversity issues. Indeed, climate change is the third most important pressure on biodiversity. Additionally, biodiversity stores carbon and plays a significant role in climate regulation.

All organisations involved in the fight against climate change must continue their mitigation efforts by reducing their contributions to pressures on biodiversity.

Our 4-step approach to support organisations reducing their impact on biodiversity

2. Our 4-step approach to support organisations reducing their impact on biodiversity

With our 4-step approach, EcoAct can help you understand the extent to which your organisation contributes to current pressures on nature, how much it depends on ecosystem services and the positive actions you could implement to simultaneously protect both biodiversity and your economic activities.

1. Raising awareness

2. Exploration

3. Evaluation

4. Action

1. Raising awareness

To begin an ecological and environmental transition, it is crucial to understand biodiversity issues in terms of definitions, challenges, key figures, etc. An awareness session can be planned for your employees and specifically for the teams involved in the biodiversity footprint, using the Biodiversity Mural . This exercise, built in collaboration with the French Biodiversity Office (OFB), is a fun and collaborative workshop to discover the systemic aspects of biodiversity erosion. The information shared is based on the IPBES reports and is organised around five modules (Figure 4).

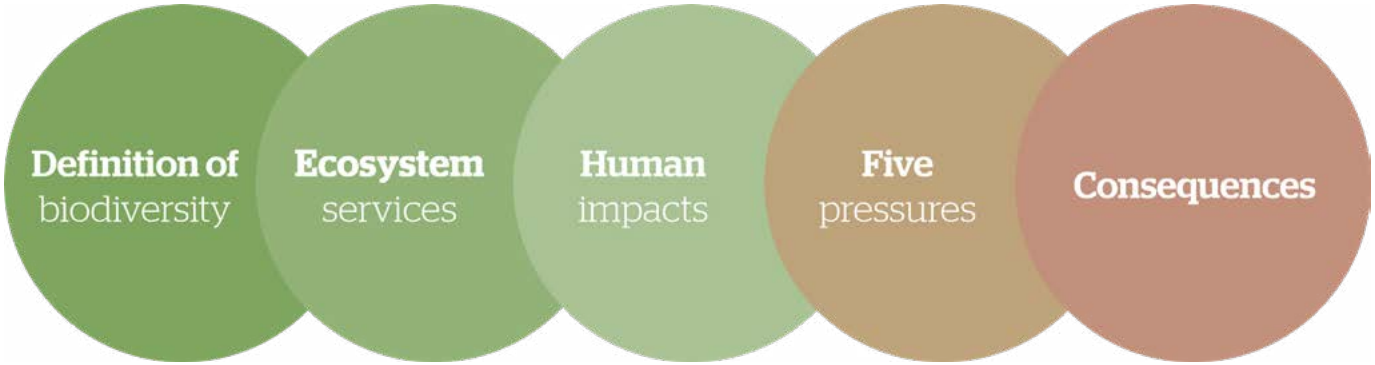

Figure 4. Five modules presented during a Biodiversity Mural (source: La Fresque de la Biodiversité)

2. Exploration

To prioritise efforts and attention, organisations need to focus on the activities, impacts and dependencies associated with biodiversity that are most relevant or 'material' to the business.

The idea is not to have a precise value but rather to identify the major impacts and dependencies related to biodiversity to identify what should be addressed as a priority and to understand the scope of the mission. Our team also uses financial data (Exiobase multi-regional input-output model) to provide an estimate of your sector's impacts. This is a modelling tool that measures the environmental impacts of economic activities.

Your organisation will then be able to identify your main impacts on biodiversity and nature: Do my activities have an impact on water? Climate? Pollution?

This analysis can also be used to qualify the main dependencies on biodiversity: Do my activities depend on pollination? On water? On soil quality?

3. Evaluation

The business context is important to determine appropriate measurement methods. The measurement method presented here uses a pressure model (GLOBIO) to identify contributions to key pressures and risks associated with a company's dependencies on biodiversity, and opportunities for mitigation.

Good to know

'Biodiversity footprint' approaches that use global-scale pressure models can produce scalable measures across value chains and facilitate a comprehensive screening process for biodiversity risks. However, they may lack the precision and spatial accuracy required for a robust measure of an impact at the site level, unlike indicators based on direct measurements from ecological inventories. (Align, 2022)

Identifying, measuring, and reporting on all biodiversity impacts can be difficult for many organisations, especially given their complex supply chains. For this reason, this step involves quantifying the intensity of the impacts and dependencies prioritised in the previous step.

To calculate the organisation's impact on biodiversity, EcoAct uses the Global Biodiversity Score© (GBS) tool designed by CDC Biodiversité. The GBS measures the impacts on Scopes 1, 2 and 3 upstream. Downstream Scope 3 can only be assessed if data is clearly available, in particular from the carbon footprint. The assessment of the biodiversity footprint is done in steps (Figure 5).

GBS GLOBAL BIODIVERSITY SCORE®

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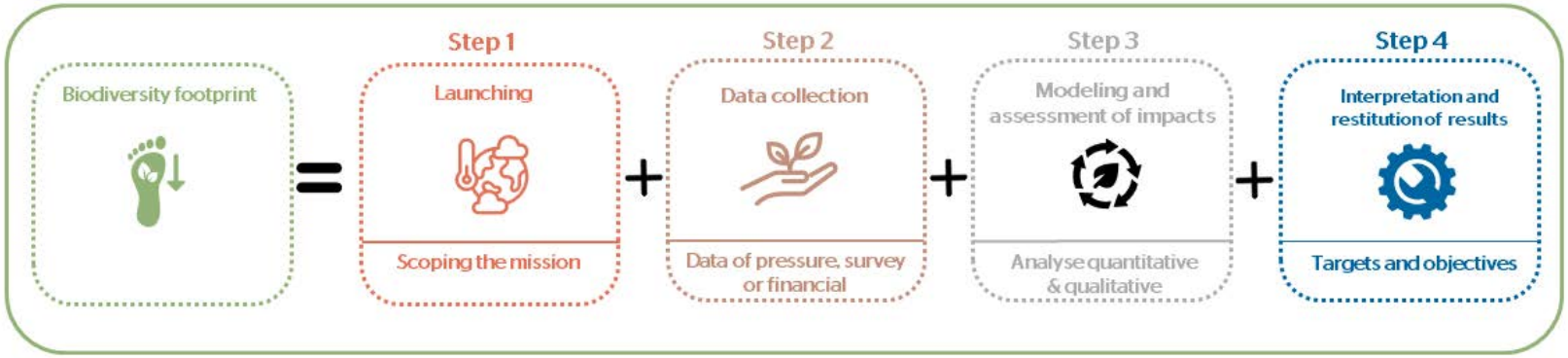


Figure 5. The four steps to calculate a biodiversity footprint (EcoAct)

Step 1 – Launching: Definition and validation of the mission objectives and scope

This stage involves assessing the availability of data to be collected, identifying the teams involved in the project and discovering the organisation (its governance, processes, activities and sources of emissions). The first step is usually to map the supply chain.

Step 2 - Data collection for biodiversity impact assessment

Before collecting the data, we work with your staff to ensure that they understand the mission and that the workload is limited for them. We provide specific data collection files and propose alternative collection methods when data is not available, defining assumptions and modelling missing data.

It is very important to note that impacts on biodiversity are site-specific. An understanding of the local context in which an organisation interacts with biodiversity is crucial to assessing its impacts.

The methodology we use allows real flexibility for data collection. Basic information on financial data can be used for the purpose of screening the impacts, but it is also possible to go deep into detail with other kinds of physical data, including physical flows, materials used, carbon footprint, and the direct measurements of pressures (Figure 6).

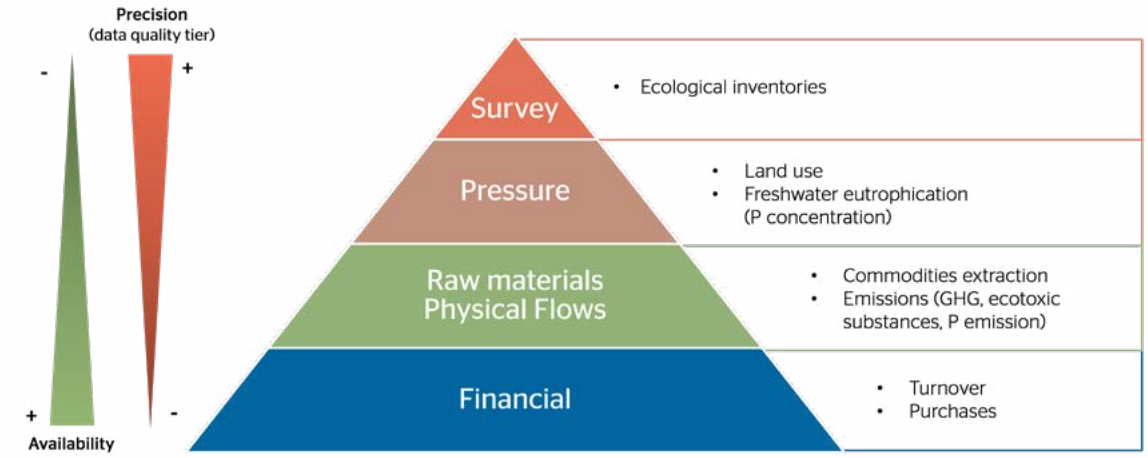


Figure 6 : Data collection for a biodiversity footprint (source : CDC Biodiversité)

Step 3 - Modelling the impacts

This step consists of validating the relevance of the data received, and performing the analysis using the GBS tool, developed by CDC Biodiversité (Figure 7); data processing will use different models depending on the input data (Table 1).

Tools	Models	Input data	Unit
Global Biodiversity Score® to quantify impacts	Exiobase	Financial data	MSA.km2 (Mean Species Abundance)
	Commotools	Physical data	
	GLOBIO	Pressures data	
ENCORE to qualify dependencies	Literature reviews	Economic sectors and geographic region	Qualitative analysis

Table 1: Models and tools used for biodiversity footprinting

This tool is aligned with recommendations and existing initiatives: it uses the IPBES pressures through the GLOBIO model, and the perimeter corresponds to the GHG Protocol (3 Scopes).

Aggregate metrics	GBS assesses the impact in MSA.km² (Mean species abundance), a measure that characterises the integrity of ecosystems.
Supply chain	GBS measures the impacts generated by economic activities across the entire value chain (3 Scopes analysis).
Static and dynamic impacts	GBS takes into account both static (accumulation of negative impacts) and dynamic (periodic gains or losses) impacts.
Pressure-impact model	The use of the GLOBIO model makes it possible to analyse the impact of economic activities on biodiversity by modelling the pressures on ecosystems.

Figure 7. Key information about the Biodiversity footprint with the GBS

Step 4 - Interpretation of the results

EcoAct offers a bespoke presentation of the results that can be displayed by entity, scope, ecosystem (terrestrial, aquatic), accounting categories (static, dynamic), pressure, etc. (Figure 8). As this data might be initially difficult to interpret, EcoAct provides explanatory support using CDC Biodiversité's sectorial benchmarks (agriculture & agrifood, chemicals, energy).

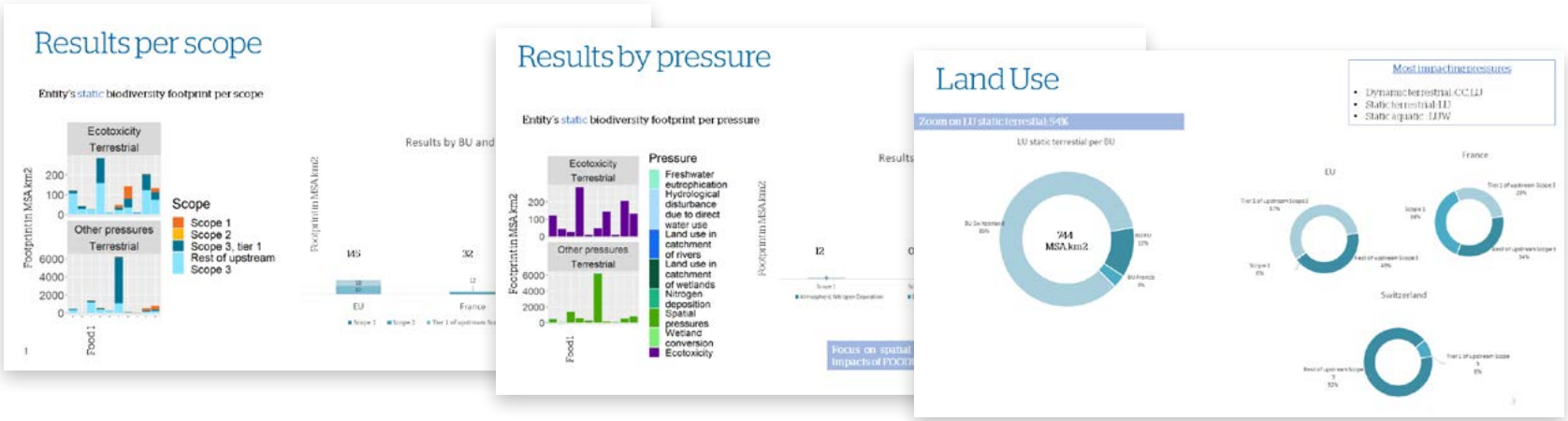


Figure 8. Examples of outputs from the GBS (Source : EcoAct)

3. Action

To go beyond the measure of a baseline footprint, EcoAct can help you set biodiversity targets to both reduce negative impacts and increase positive impacts, taking into account the links between biodiversity, climate and sustainable development.

The goal is to integrate biodiversity into risk management and decision-making processes across all activities. That's why prioritisation is important, particularly when it comes to focusing on those activities that are most relevant or 'material' to your business.

Upcoming reporting frameworks, such as the SBTN and TNFD, are developing methodologies to help organisations identify and prioritise the location of their most significant impacts. EcoAct is aligned with these frameworks, including the Global Biodiversity Framework defined at COP 15, which aims to halt biodiversity loss by 2030 and regenerate it by 2050 through the "avoid, reduce, regenerate, restore, transform" model. Different actions can be considered to achieve the defined targets, such as sourcing products from ecosystems managed to maintain or enhance biodiversity, investing in nature-based solutions with biodiversity co-benefits, monitoring biodiversity indicators, participating in working groups, training employees on biodiversity issues, and communicating and making efforts transparent.

For example, it is possible to communicate your organisation's biodiversity efforts via CDP's questionnaires, which now include questions related to biodiversity. At EcoAct, we can also support you in your CDP reporting process.

To ensure sustainable and effective action, follow-up of actions and efforts is necessary by monitoring biodiversity impacts, dependencies, risks and opportunities, tracking changes and verifying improvement of indicators.

Biodiversity is multifaceted and difficult to capture in a single measure; however, calculating your organisation's biodiversity footprint provides an overview of the capacity of ecosystems to deliver the ecosystem services on which your activities depend and allows for an effective assessment of changes in biodiversity. For a more comprehensive assessment that captures the risks associated with the loss of individual species, a species-level measure, including extinction risk and population size, should also be considered (Align, 2022).

Important

It is not possible to say that a company or product is "biodiversity neutral" or has a "net positive impact" (Houdet, J & Teren, G. 2022. Quality Biodiversity Footprint Assessments in Practice: Why Organisational Biodiversity Accounting Matters). The priority is to implement actions to reduce an organisation's negative impact on ecosystems and increase positive impacts. Any other quantified objective must be verifiable.

3. Why choose EcoAct?

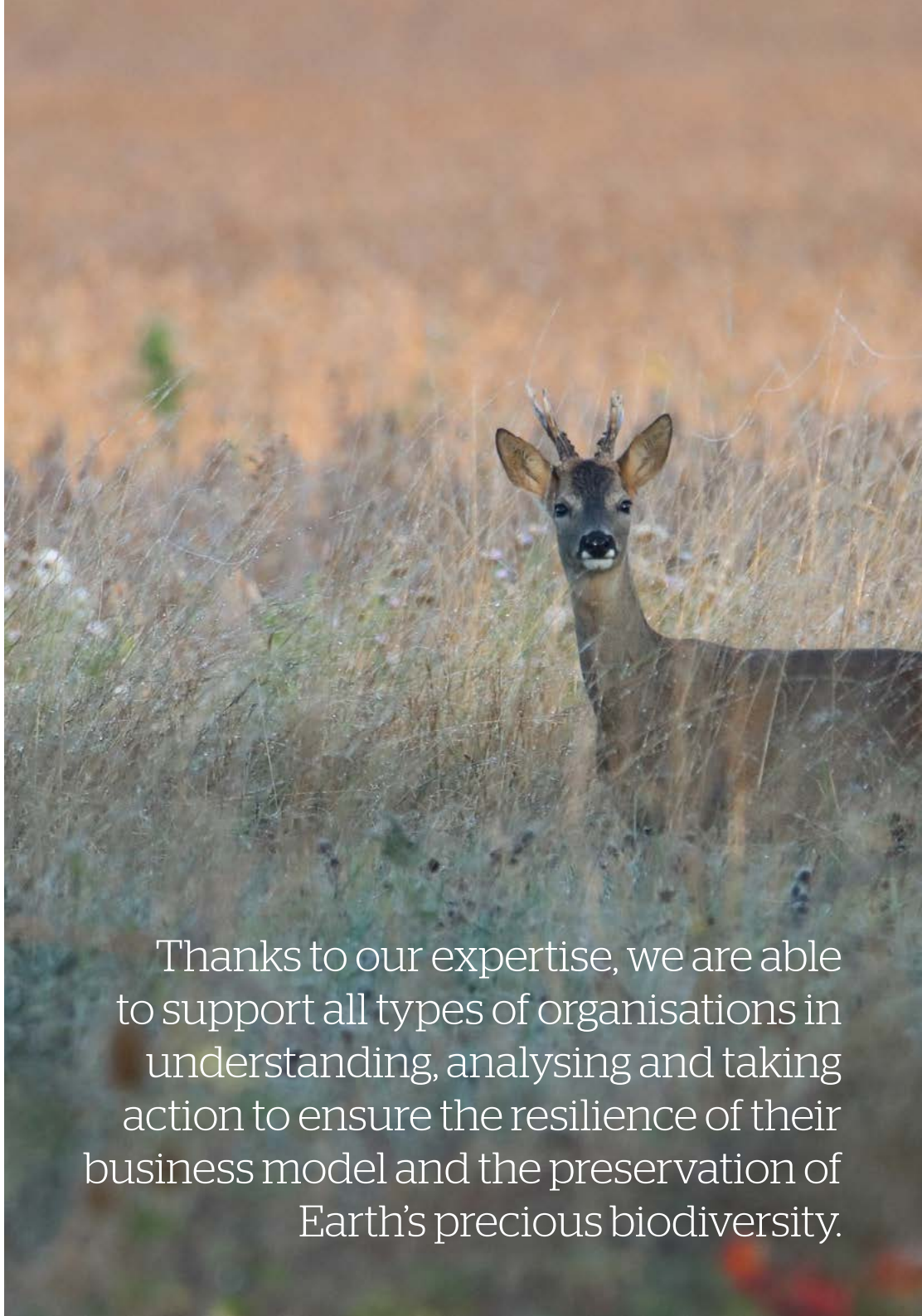
3. Why choose EcoAct?

At EcoAct, we are continually strengthening our internal expertise to be at the forefront of the latest scientific recommendations in the fight against climate change.

As climate and biodiversity are closely linked, it was natural to include support for biodiversity preservation and restoration into our service offering.

We now have a team dedicated to biodiversity preservation, and trained in biodiversity footprint methodologies.

In addition, EcoAct is proud to be a partner of the European CircHive project, which aims to develop a standardised methodology combining two approaches: the biodiversity footprint and natural capital accounting. The ultimate goal of CircHive is to structure and accelerate the transition to a circular bioeconomy on a European scale. Through the collaboration between 15 research institutes and 10 partners for the development of sectoral case studies, this project will enable the design of new sustainable business models. With the help of academic, private and public stakeholders, CircHive aims to create a community of pioneer organisations called BEEHive (Biodiversity Excellence of Enterprises) to bring together companies and communities willing to develop sustainable business practices by testing and co-building CircHive's achievements.



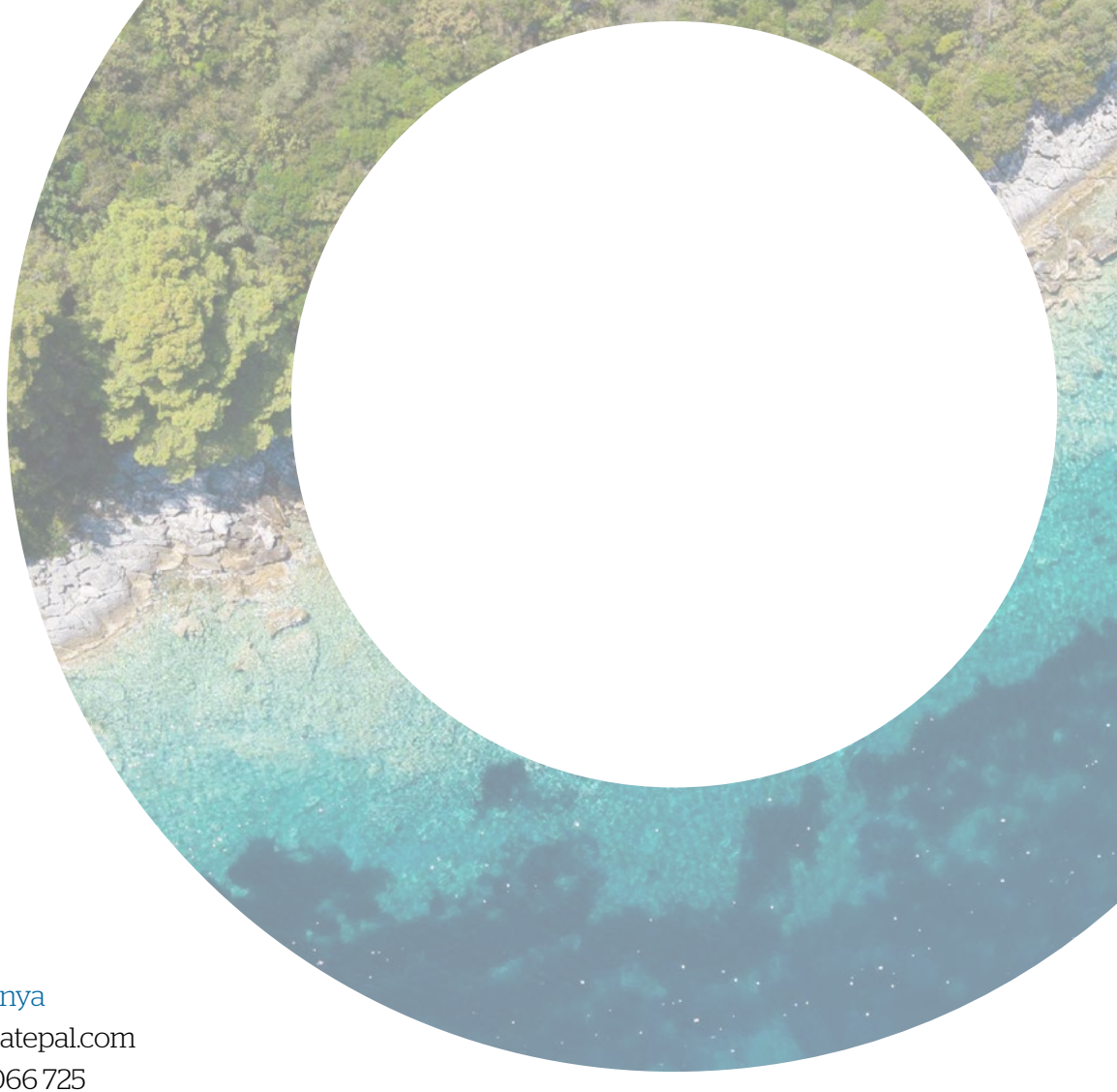
Thanks to our expertise, we are able to support all types of organisations in understanding, analysing and taking action to ensure the resilience of their business model and the preservation of Earth's precious biodiversity.

Factsheet

Your climate experts.
Your partner for positive change.

EcoAct, an Atos company, is an international climate consultancy and project developer that supports companies to set robust science-aligned net-zero strategies and achieve their climate targets. Founded in France in 2006, the company now spans three continents with offices in Paris, London, Barcelona, New York, Montreal, Munich, Milan and Kenya.

With a team of more than 360 international climate experts, EcoAct's core purpose is to lead the way in delivering sustainable business solutions that deliver true value for both climate and client. EcoAct is a CDP Gold Partner, a founding member of ICROA, a strategic partner in the implementation of the Gold Standard for the Global Goals and reports to the UN Global Compact.



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