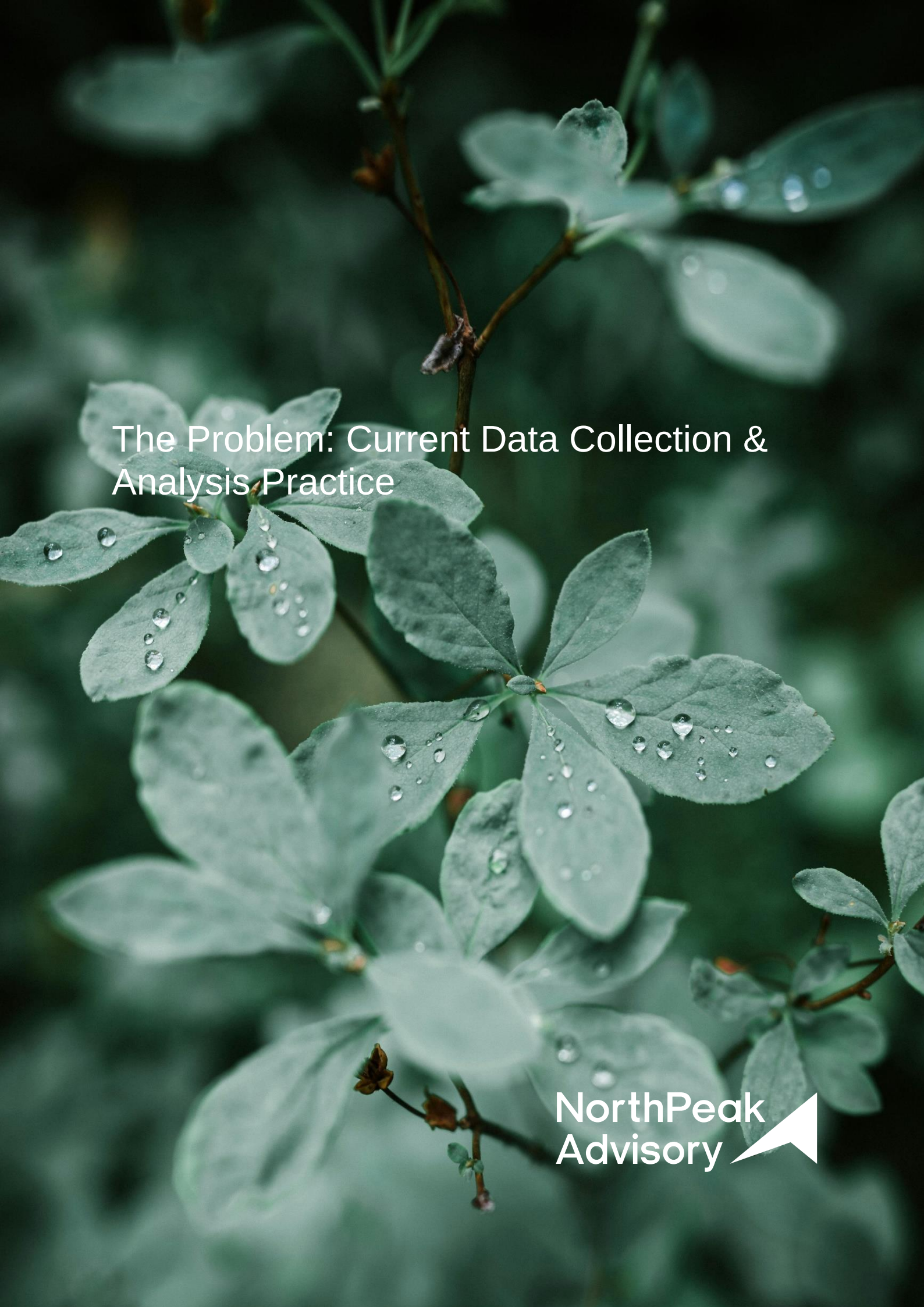


The Problem: Current Data Collection & Analysis Practice

NorthPeak Advisory

The Problem: Current Data Analysis & Practice

As established in our first paper "*The Importance of Biodiversity*", biodiversity is a systemic risk, with a multitude of regulations and industry initiatives now aimed at advancing biodiversity restoration and conservation. **Now is the time to transform our biodiversity aspirations into outcomes**, and a comprehensive and consistent approach for measuring the "state of nature" will be the deciding factor in determining our success at tackling the biodiversity challenge. Unfortunately, the current state of biodiversity data is **fragmented and inconsistent,** and is lacking of data that captures the multi-dimensional complexity of our ecosystems.

Currently, the most common approach investors and corporates use to understand their biodiversity dependencies and impacts will include a combination of the following measures:

Measure	Definition	Example Metrics / Tools
Economic quantification of activities	The amount of material an organisation extracts, produces, purchases, or finances	• Company Revenues • Production Volumes
Pressures on biodiversity/impact drivers	Company activities that are impacting biodiversity	• Greenhouse Gas Emissions • Water Abstraction • Deforestation
Quality of company management	How well a company is managing its exposure to biodiversity	• Product certifications • Existence and quality of biodiversity-related policies • Regulatory fines related to biodiversity
Location-based information	Is the company situated in a location of known biodiversity importance?	• Proximity to identified sites of high biodiversity value • Proximity to protected areas

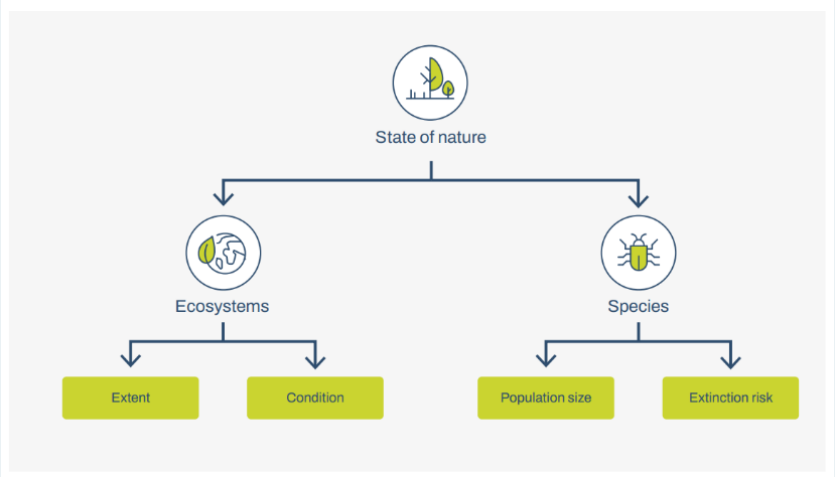
Although the aforementioned information is important for understanding a company's dependencies and impacts on biodiversity and should not be discounted, none of them directly capture the "state of nature".

What is the State of Nature?

The **state of nature is described as the "condition and extent of ecosystems, and species population size and extinction risk, including positive or negative changes**."[1] Essentially, it represents a comprehensive view of ecological integrity within a specific area, informed by genetic and species-level data across various organisms, as well as broader assessments of the ecosystem structure.

[1] Adapted from United Nations.et al. (2021) System of Environmental-Economic Accounting – Ecosystem Accounting (SEEA EA)

Figure 1 – The State of Nature[2]

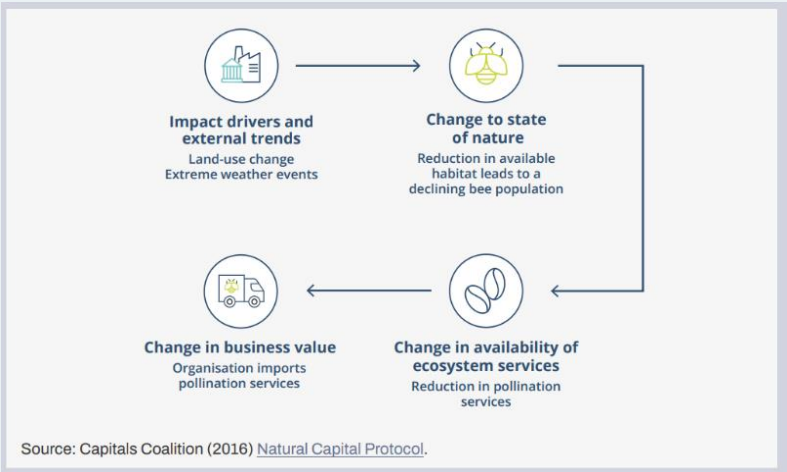


Developing, measuring, and reporting on the state of nature, however, presents significant challenges. According to estimates from the World Benchmarking Alliance, only "**5% of 389 companies analysed in their Nature Benchmark have conducted a science-based assessment to demonstrate how their operations impact nature and biodiversity**."[3] A major obstacle is the lack of a universally accepted metric for the "state of nature," in contrast to climate change, where the impact is commonly measured in tonnes of CO2e. Due to the highly specific nature of biodiversity impacts and dependencies, which vary by location, ecosystem, and activity, it is impractical to encapsulate the state of nature within a single metric.

Why is the State of Nature so Important?

As the integrity of an ecosystem underpins its ability to support the social and economic functions upon which we depend, it is crucial to have a comprehensive measurement of the state of nature. This would not only provides context for other metrics but also **supply stakeholders with decision-useful information** regarding the extent to which their activities affect ecological integrity. Furthermore, it would offer stakeholder with insights on how to effectively address their biodiversity dependencies and impacts. In essence, without a clear understanding of the state of nature, all other information used to assess biodiversity dependencies and impacts lacks meaningful context.

Figure 2 – Role of the state of nature in business value[4]



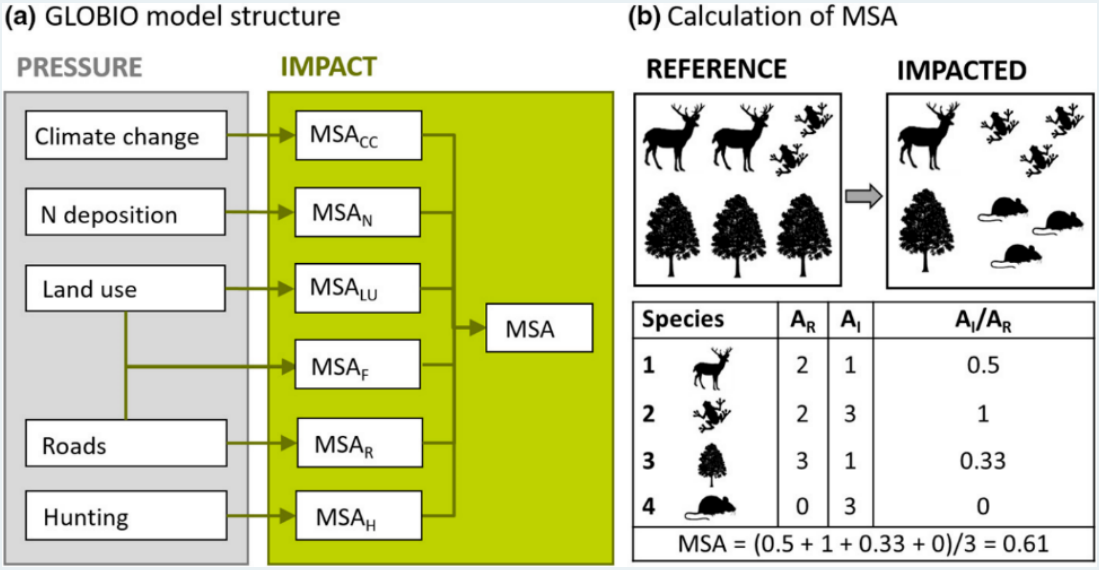
[2] https://tnfd.global/wp-content/uploads/2023/08/Guidance_on_the_identification_and_assessment_of_nature-related_Issues_The_TNFD_LEAP_approach_V1.1_October2023.pdf
[3] https://www.worldbenchmarkingalliance.org/news/nature-benchmark-press-release-2022/#:~:text=Although%20the%20value%20chains%20of,impact%20on%20nature%20and%20biodiversity.
[4] https://tnfd.global/wp-content/uploads/2023/08/Guidance_on_the_identification_and_assessment_of_nature-related_Issues_The_TNFD_LEAP_approach_V1.1_October2023.pdf

Our Current Understanding

Currently, our understanding of the state of nature is primarily captured through a select few metrics, with Mean Species Abundance (MSA) being the most widely recognised.[5] MSA also forms the basis of many commonly used biodiversity footprint metrics,[6] such as the Corporate Biodiversity Footprint (CBF).[7]

MSA "compares the actual abundance of native species in a given ecosystem to their (estimated) abundance if the ecosystem would be in an undisturbed state."[8] It is calculated using species distribution models, such as GLOBIO, which estimates the presence of species based on known environmental pressures, such as climate conditions, habitat availability, food resources and human impact. An MSA of 0% indicates that an ecosystem has lost all its original biodiversity, whilst 100% refers to a pristine ecosystem that has not been impacted by human activities[9].

Figure 3 – Indicative diagram of how MSA is calculated[10]



Despite the popularity of MSA, it does suffer from two major limitations.

Limitation 1 – Heavily Modelled and Not Location Specific

Since MSA is an inferred metric, it **lacks specific information about individual ecosystems and depends largely on modelled data and global biodiversity averages**. While this approach offers practical benefits in terms of applicability and scalability—since pressures are generally easier to measure, track, and compare across ecosystems—it **sacrifices location specificity**. This omission is significant given the highly location-specific nature of biodiversity and ecosystem service impacts and dependencies. Additionally, MSA's reliance on existing data, which is often unavailable, incomplete, or unevenly distributed across regions and landscapes, biases it towards well-studied species and

[5] https://www.man.com/maninstitute/care-about-biodiversity
[6] Tools that are designed to understand and report the level of impact an organization has on the decline or restoration of biodiversity and the main causes leading to this impact – https://www.biodiversity-metrics.org/uploads/1/2/7/5/127509512/bridging_the_gap_between_biodiversity_footprint_and_biodiversity_state_indicator_metrics_2e.pdf
[7] The Corporate Biodiversity Footprint models the impact of corporates/assets/sovereigns based on the products or services purchased or sold – https://www.financeforbiodiversity.org/wp-content/uploads/Finance-for-Biodiversity_Guide-on-biodiversity-measurement-approaches_3rd-edition-1.pdf
[8] https://www.financeforbiodiversity.org/wp-content/uploads/Finance-for-Biodiversity_Guide-on-biodiversity-measurement-approaches_3rd-edition-1.pdf
[9] There is currently debate around how pristine sites are defined, with the growing view that it is a "mistaken belief that successful conservation outcomes require "pristine wilderness" free from human inhabitants". https://www.ohchr.org/sites/default/files/Documents/Issues/Environment/SREnvironment/policy-briefing-1.pdf
[10] https://www.globio.info/wp-content/uploads/2020/02/Pub_paper_schipper_et_al_2019.png

regions[11]. Consequently, **lesser-known species and regions are likely underrepresented, which could skew understanding and remediation efforts**.

Limitation 2 – It does not account for a fraction of the state of nature

The second, and more fundamental, limitation of MSA is that it **cannot fully capture the "state of nature".** While MSA is useful for tracking changes in species abundance and can thus be used to proxy changes in ecosystem condition, **its sole focus on abundance means it neglects other crucial species-related indicators**, such as:

- Species Richness: The total number of different species present within a particular ecosystem.
- Species Evenness: The degree of similarity in the abundance of different species within a given ecosystem.
- Species Diversity: A quantitative measure that reflects the variety of species in a specific location.
- Trait Diversity: This measures the variety and distribution of functional traits within a community or ecosystem, shedding light on the functional differences among species and their contributions to ecosystem processes.

For example, in a forest ecosystem, the presence of invasive species may be the primary reason behind the decline in ecological integrity, outcompeting native species, as well as altering habitats and affecting water and soil health. However, **as MSA cannot differentiate between invasive and native species, relying on this metric may potentially mask the decline in native species, thereby giving an inaccurate picture of ecosystem integrity**.

Furthermore, even if you were to account for all of the species-related indicators above, species information still only provides one element of the state of nature. It is important to remember that a truly holistic view of the **state of nature must include broader aspects, such as "genetic diversity, diversity of species, and the intactness of ecosystems that enable them to function for the benefit of society**."[12]

It is worthwhile highlighting that MSA is not the only state of nature metric that suffers from the aforementioned challenges; other commonly referenced state of nature metrics, such as Potentially Disappeared Fraction ("PDF") and Species Threat Abatement and Restoration ("STAR"), encounter similar issues. These metrics, while useful, often fail to provide a complete picture of an ecosystem's health and functionality.

Consequences

The challenge with measuring the "state of nature" is something that reporting frameworks / standards, such as TNFD and CSRD, are aware of, hence the large degree of flexibility they permit when entities report on biodiversity impacts. While this flexibility is useful in the short term**, it is not a viable long-term solution**. Without a consistent understanding or methodology, two organisations might employ vastly different methods for assessing their impact on biodiversity. This lack of standardisation could lead to perverse incentives, where organisations manipulate these metrics to conceal or misrepresent their actual impacts on biodiversity.

What is the Solution?

The saying "don't let the perfect get in the way of the good" often gets thrown around when discussing the challenges with the current biodiversity data landscape, particularly concerning state of nature metrics. These metrics are often defended due to the perceived time and cost challenges associated with gathering location-specific data. **However, what we currently have is simply not adequate. These metrics fail to capture the complex interactions among species, ecosystems, and human activities**. Relying on them—whether alone or in combination—as a measure of the state of nature is, at best, misleading and, at worst, deceptive.

[11] https://nsojournals.onlinelibrary.wiley.com/doi/10.1111/ecog.06604
[12] bridging_the_gap_between_biodiversity_footprint_and_biodiversity_state_indicator_metrics_2e.pdf (biodiversity-metrics.org)

It is concerning that these metrics are actively used by companies reporting on biodiversity and by investors during their decision-making processes. The truth is that if any of the biodiversity-related initiatives, reporting frameworks and regulations highlighted in our first paper “The Importance of Biodiversity” are to have a fraction of their desired impact, **we will need to evolve our concept of the “state of nature” into a framework that is standardised, quantitative, location-specific, scientifically verifiable, and rapidly deployable at scale across multiple ecosystems**.

Fortunately, the scientific foundation is already in place, and here at NorthPeak Advisory, we are addressing this **by developing a proprietary, comprehensive framework that quantifies and unifies the various levels of biodiversity.** We will take a deep dive into the species-related aspect of this framework in our next paper “The Solution: NPA’s Reporting Framework & eDNA”

About NorthPeak Advisory

NorthPeak Advisory is a boutique Sustainability advisory firm supporting asset managers and corporates across all stages of sustainability integration. We partner with our clients to develop industry-leading, streamlined solutions that enhance the efficiency of sustainability efforts, turning data and environmental science into strategic business advantages.

The shifting ESG and sustainability landscape is unpredictable with new challenges are constantly arising. From industry leading double materiality assessments for CSRD, creating bespoke responsible investment strategies and developing a cutting-edge scientific framework for the highest standard in biodiversity measurement and tracking, we stay on the front edge of sustainable transformation and constantly innovate to incorporate the latest data-led approaches into the development of our solutions.

As a signatory to the UN-Supported Principles for Responsible Investment ("PRI"), NorthPeak Advisory is a supporter of "SPRING", a PRI stewardship initiative for nature. We hope that our biodiversity solutions will support the institutional investors in using their influence to halt and reverse global biodiversity loss by 2030.

Benjamin Stone, Associate

Benjamin works as part of the Advisory Team, playing a leading role within client engagements. His areas of focus include conducting investment strategy ESG and Responsible Investment assessments, creating bespoke ESG integration frameworks, leading ESG Training sessions, ensuring alignment with both regulatory and reporting requirements, such as EU SFDR, UN PRI, TCFD, and GRESB. Benjamin has a strong understanding of responsible investment, and his extensive experience allows him to build tailored solutions that are aligned with a client's investment strategy and asset class.

Benjamin holds a first-class BSc in Politics and History from the London School of Economics and Political Science. He also holds the CFA Certificate in ESG Investing.