



BIODIVERSITY | METALS AND MINING

Operationalizing Nature Positive Concepts in Mine Closure

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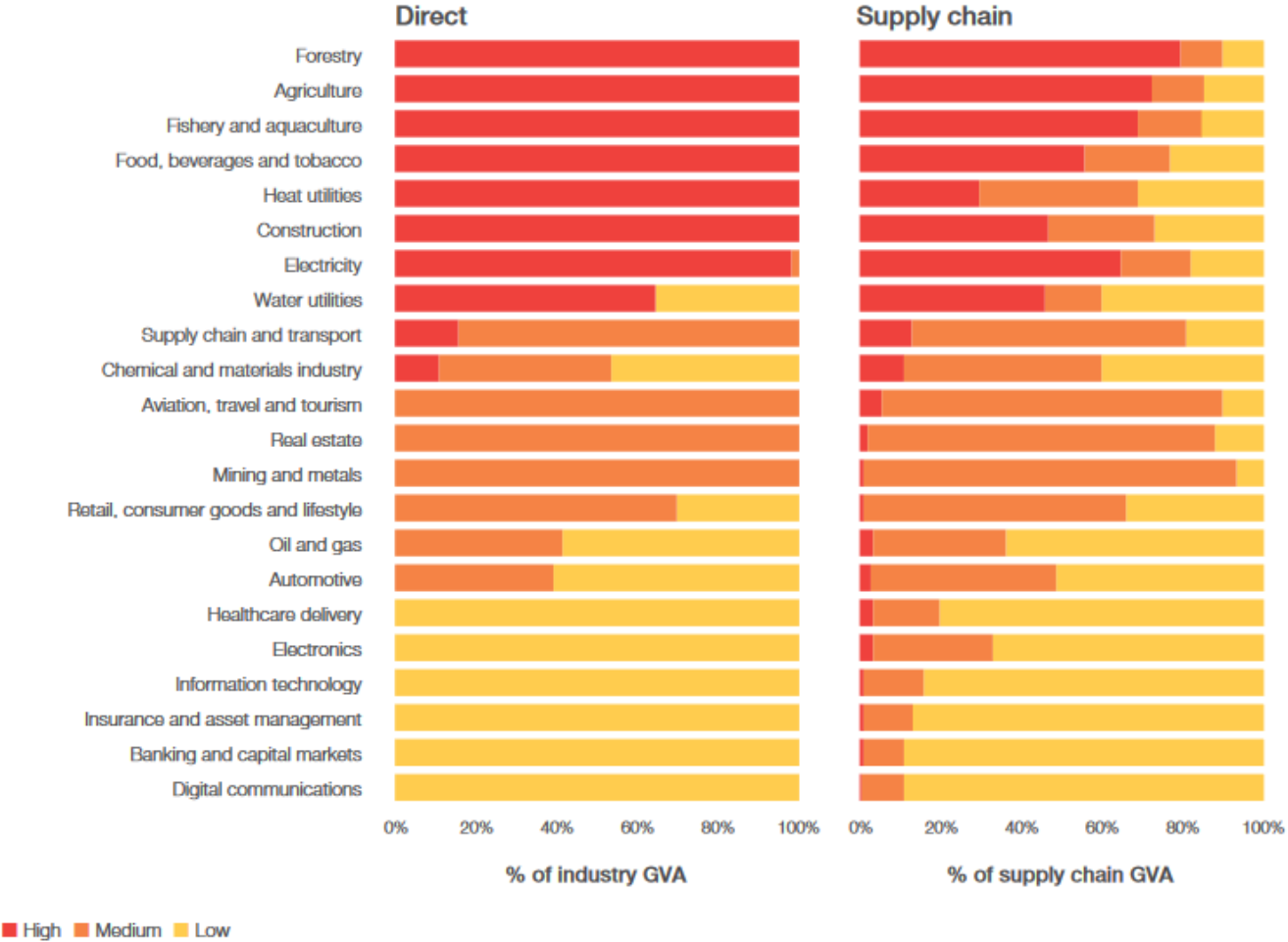
Introduction

Incorporating natural capital consideration into mine closure can drive corporate value.

The global biodiversity crisis is upon us. Through unprecedented animal and plant species extinction rates, some one million species are currently at risk.¹ We are crossing critical planetary boundaries for climate, land use, biodiversity, and other systems. As a result, the World Economic Forum ranks “biodiversity loss” and “human environmental damage” as among the top risks.²

Businesses’ dependence and impact this natural capital creates risk and opportunities. With regards to dependence, more than half of the world’s gross domestic product, US\$44 trillion, is moderately or highly dependent on nature.³ On the impact side, land conversion, climate change, and pollution are the most important. Some of the business opportunities needed to provide products and services with lower impact have been estimated at USD 10 trillion through 2030.⁴

1/2 of world’s GDP is highly or moderately dependent on nature³



Introduction (continued)

On the risk side, two groups are notable:

- **Physical**—acute and systemic loss of access to water, raw materials or natural protections against storms
- **Transition**—regulators, customers and communities have ever higher demands for corporate behaviour and sustainable products and services⁵

Importantly, these risks and opportunities are growing.⁴

In response, the Global Biodiversity Framework was signed in December 2022. This spurred Australia, U.S. and other governments to start returning 30% of ecosystems to nature by 2030.

On the voluntary side, the Taskforce Nature-related Financial Disclosures was launched in September 2023 and disclosure standards (e.g., GRI, CSRD, ISSB) are align their methods with TNFD.

In parallel, term “nature positive” has emerged to capture the need to halt and reverse the loss of nature.⁶

Nature Positive

While still evolving, nature positive is understood as aligning with the planetary boundaries, the 30 X 30 goal and the GBF more broadly. It calls on corporations to account for the full scope of their impacts, embrace the ecological equivalency principle (like for like, kind for kind), and use 'corporate natural capital accounting', the mitigation hierarchy, among other methods.

A nature positive mining company would effectively minimize risks and exploit opportunities. The industry has already been embracing these nature positive concepts.⁷

However, no guidance exists for integrating nature positive concepts into closure.



Operationalize Nature Positive Concepts

Monitoring, maintenance and management

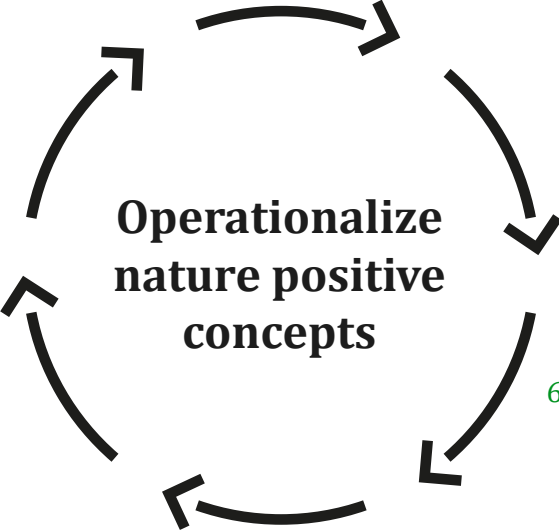
- 9. Including biodiversity and final ecosystems services
- 10. Using corporate natural capital accounting methods

Knowledge base

- 1. Expanding biodiversity measures
- 2. Including final ecosystem services
- 3. Delineating non-regulated areas

Vision, principles and objectives

- 4. Enhancing natural capital targets
- 5. Committing to corporate natural capital accounting



Risk and opportunities

- 6. Conducting a full risk and opportunity analysis

Success criteria

- 7. Improving measures

Closure Plan

- 8. Including nature positive actions

Ten nature positive concepts can be introduced into the six generic steps of closure. They help move mines towards nature positive.

Legend

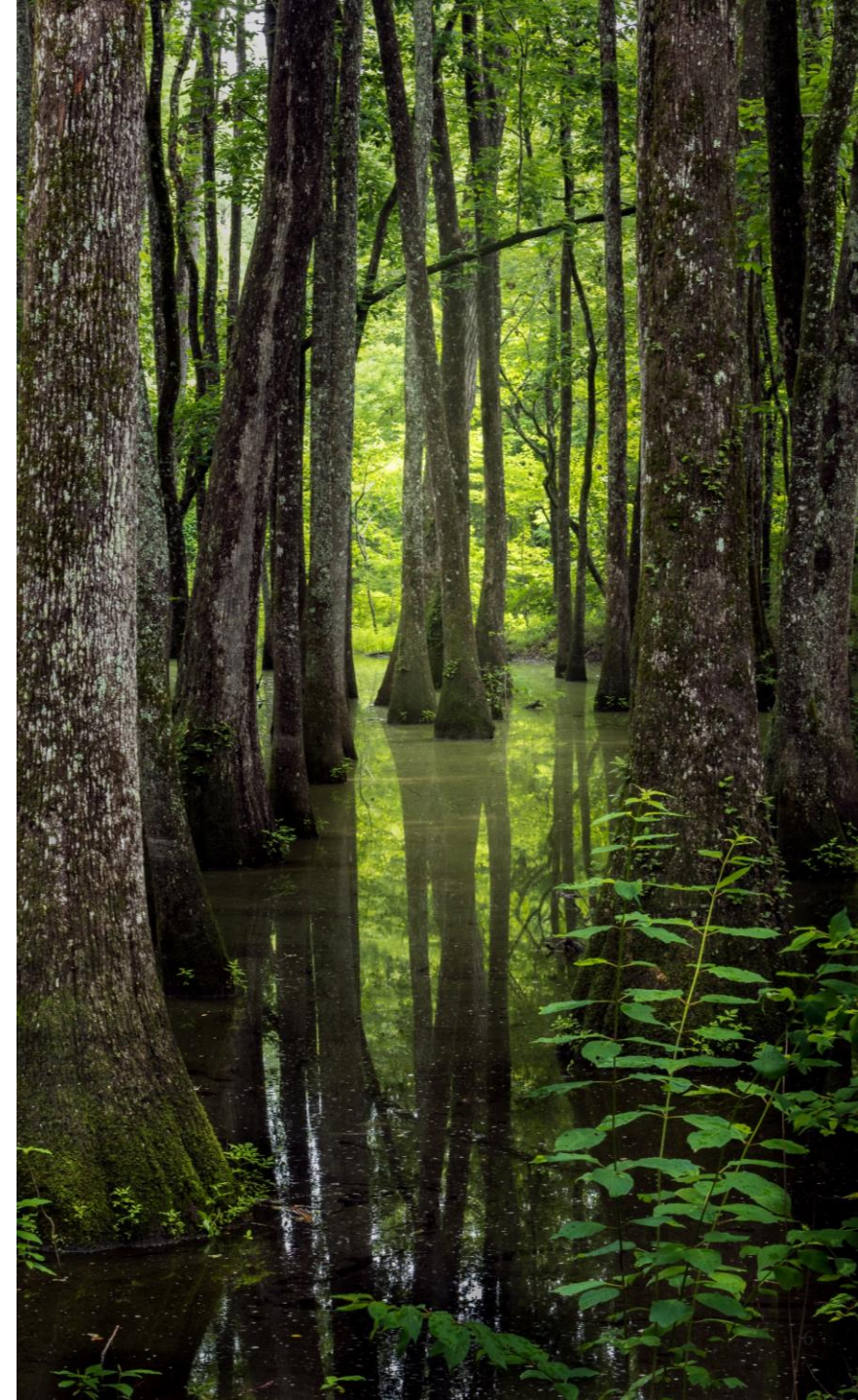
- Closure steps in **bold**
- Nature positive concepts in green

1. Expanding Biodiversity Measures

The knowledge base related to biodiversity measures needs to expand so they are aligned with nature positive and corporate natural capital accounting.

This includes:

1. Measuring the full scope of nature, not only those aspects required by nature.⁸
2. The mitigation hierarchy must be used and any necessary data must be collected to demonstrate compliance.⁸
3. While not required under definitions of nature positive, corporate natural capital accounting should be considered. These methods yield data that is comparable from site to site, auditable, can be consolidated across a company, among other benefits. Effectively this requires delineating the entire site's ecosystem types, their extent, and their conditions and then using this data to compute the state of the site's ecosystems through condition adjusted hectares.⁸



2. Including Final Ecosystem Services

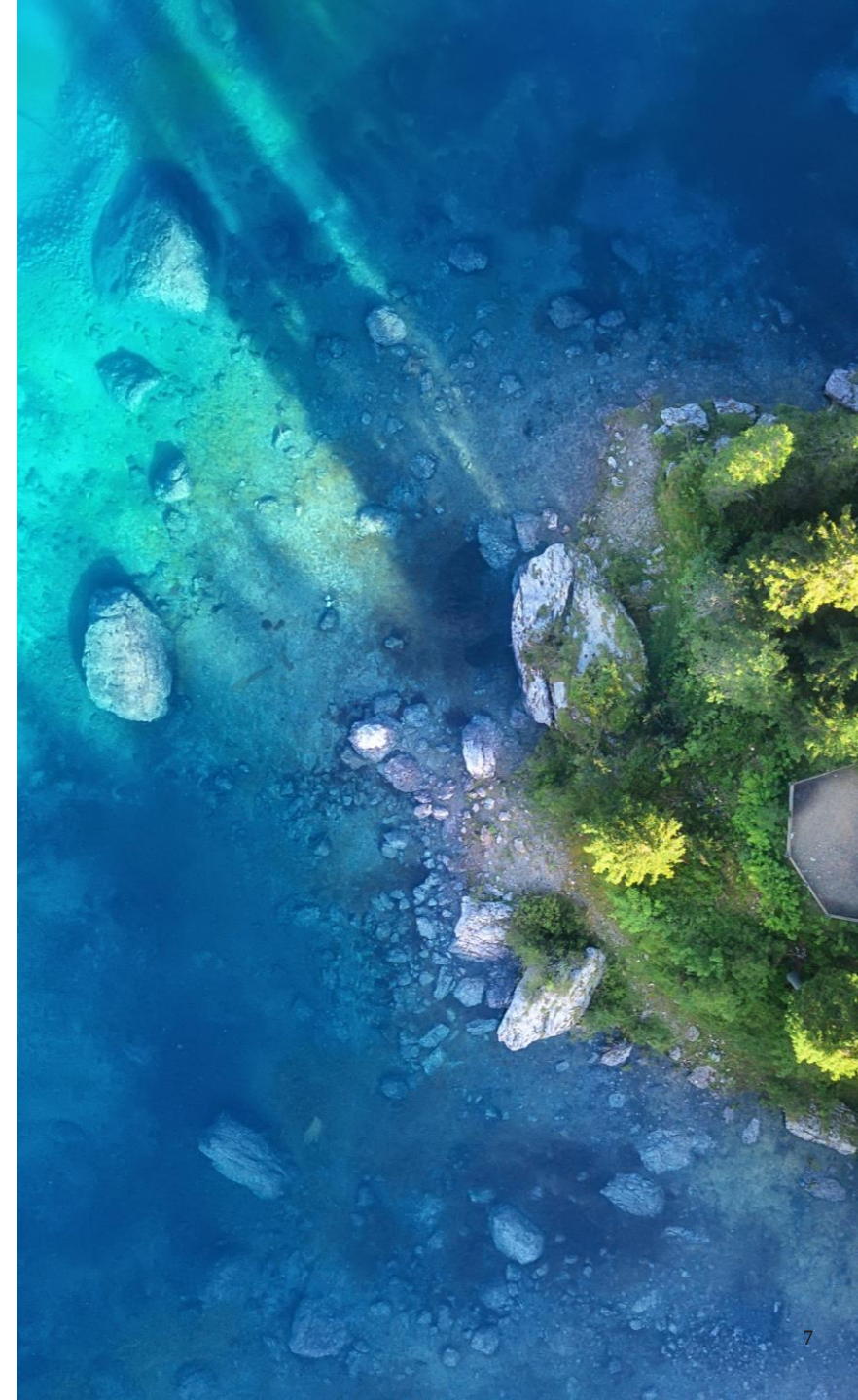
The knowledge base needs to include final ecosystem services; the point where an ecological end-product transitions from being predominately ecological to being either an economic input or something directly used or appreciated. Final ecosystem services provide a way to connect the state of nature with social and economic uses from foraging to hunting to cultural ceremonies.

Operationalizing them requires:

1. Understanding how the ecosystems are being used
2. Identifying the data required to model those uses
3. Collecting this data

3. Delineating Non-Regulated Areas

The knowledge base should also delineate areas such as buffer zones that are more likely to qualify for use in environmental markets (e.g., carbon trading, species trading, wetland banking). Hence, they offer revenue opportunities and are likely to form a large part of post closure land use in coming years.



4. Enhancing Natural Capital Targets

Closure's vision, principles and targets need enhanced natural capital targets.

For most sites, this equates with net positive or no net loss goals. Targets should :

1. Be focused on the state of ecosystem (i.e., extent and quality of ecosystems).
2. Meet the Science Based Targets for nature or other regional or local conservation targets that are consistent with the planetary boundaries.⁹

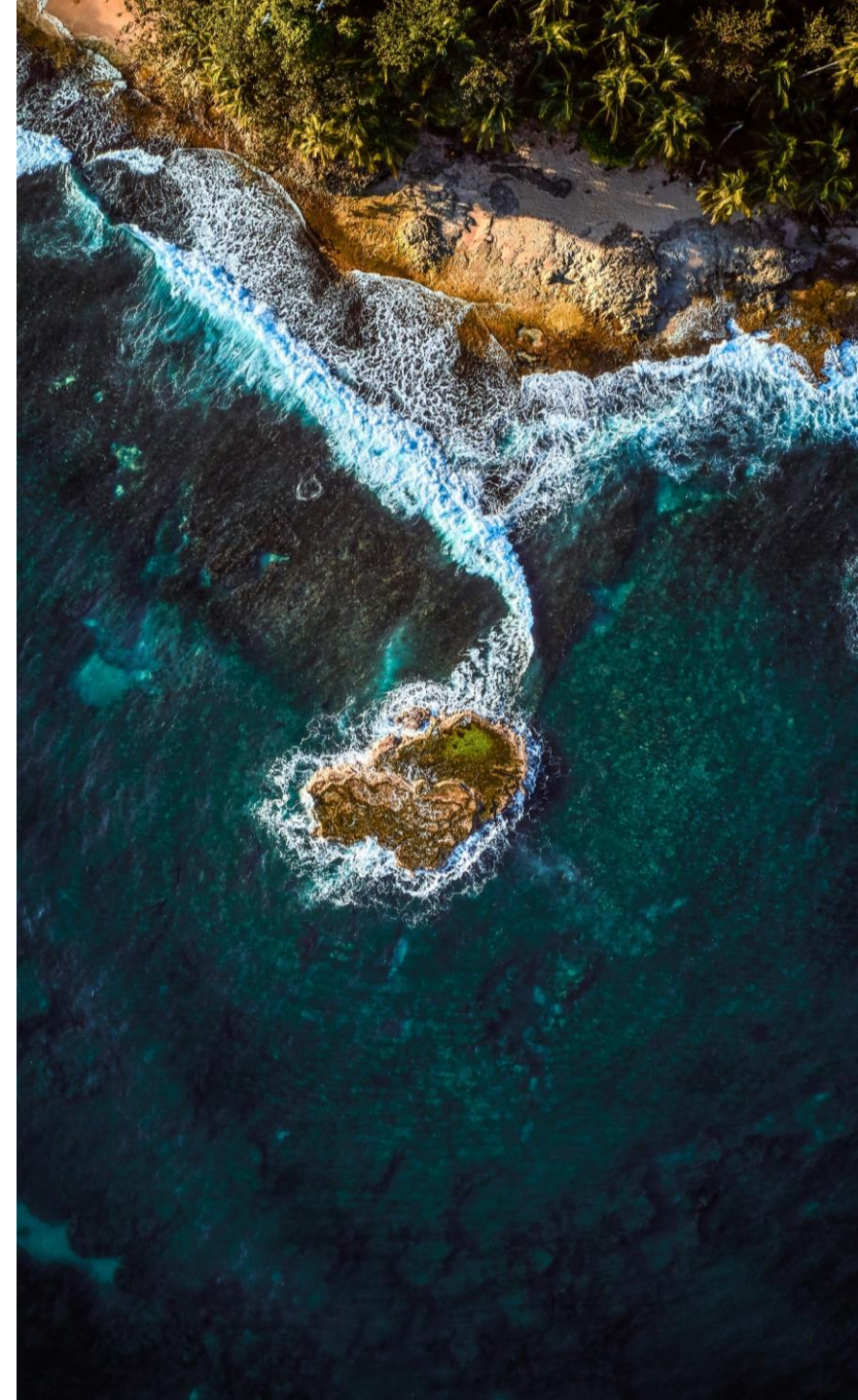


5. Committing to Corporate Natural Capital Accounting

The vision, principles and objects of closure need to embrace corporate natural capital accounting's seven standardizations.

They are:

1. Defining the ecosystem, or natural capital, as an asset
2. Developing 'natural capital asset registers of stocks'
3. Measure changes in the state of natural capital using appropriate methods
4. Employing recording rules and journal entries
5. Building statements of performance
6. Building statements of position
7. Using valuation or other analytical methods based on the stock data¹⁰



6. Conducting a Full Risk and Opportunity Analysis

Conducting a full risk and opportunity analysis related to natural capital helps ensure that not only are all material issues covered, but that the rationale for a specific nature positive action is thoroughly justified. Key guides for conducting this analysis include TNFD and Science Based Targets for nature.

7. Improving Natural Capital Measures

Success criteria also needs to improve so that measures:

1. Include the full scope of nature (see step 1)
2. Collect data to demonstrate compliance with the mitigation hierarchy (see step 1)
3. Adopt corporate natural capital accounting (see step 1)
4. Include final ecosystem services (see step 2)
5. Are focused on the state of nature.
6. Are aligned with the SBTs for nature or local goals that are aligned with the planetary boundaries



8. Including Nature Positive Actions

Closure plans need to include nature positive actions (e.g., ecosystem restoration, environmental markets) to be imbedded in closure planning. These should undergo the same screening as other projects, but also consider the co-benefits from biodiversity restoration (e.g., revenue from a carbon market, reduce downstream flooding and provide foraging opportunities).

9. Including Biodiversity and Final Ecosystem Services Measures in Monitoring Programs

Monitoring, maintenance and management programs need to expand their understanding of biodiversity (see concept 7) and include final ecosystem services (see concept 2).

10. Using Corporate Natural Capital Accounting Methods

Monitoring, maintenance and management programs need to use methods from corporate natural capital accounting (see concept 5).



Final Thoughts

In implementing these steps as part of closure, companies should gain a fuller and clearer understanding of their site's nature related risks and opportunities, create more advanced targets, build stronger strategies for achieving them and create new revenue opportunities (most commonly these revenue opportunities are in environmental markets).

Exploring these market opportunities could be the easiest route to integrating nature positive concepts into closure planning. Not only should markets have broad interest within companies, but the measurement methods used for many markets align with corporate natural capital accounting.



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References

1. IPBES. 2019. Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. E. S. Brondizio, J. Settele, S. Díaz, and H. T. Ngo (editors). IPBES secretariat, Bonn, Germany. 1148 pages. <https://doi.org/10.5281/zenodo.3831673>
2. World Economic Forum (WEF). 2022. The Global Risks Report 2022 17th Edition https://www3.weforum.org/docs/WEF_The_Global_Risks_Report_2022.pdf
3. Herweijer, C., Evenson, W., Mariam, S., Khatri, A., Albani, M., Semov, A., Long, E. 2020, Nature Risk Rising: and the Economy Nature Matters for Business Why the Crisis Engulfing, New Nature Economy Project (Issue January), viewed 2 June 2023 http://www3.weforum.org/docs/WEF_New_Nature_Economy_Report_2020.pdf
4. World Economic Forum, 2020. The future of nature and business, New Nature Economy Report II. Geneva.
5. Taskforce on Nature Related Financial Disclosures. (2021). TNFD Proposed Technical Scope. <https://tnfd.info/wp-content/uploads/2021/06/TNFD---Technical-Scope-1.pdf>
6. IUCN. 2022. Towards an IUCN nature-positive approach: a working paper. <https://www.iucn.org/sites/default/files/2022-10/nature-positive-summary-highlights-oct-2022.pdf>
7. EU Business & Biodiversity Platform. 2022. The Platform's 'current working definition' of 'nature positive' in a business context. https://green-business.ec.europa.eu/business-and-biodiversity/our-activities_en
8. ICMM. 2023a. ICMM Webpage Nature. <https://www.icmm.com/en-gb/our-work/environmental-resilience/nature>. Viewed August 27, 2023.
9. STBN. 2023. <https://sciencebasedtargetsnetwork.org/>
10. Capitals Coalition. 2022. Time to Take Stock Version 2.1. <https://capitalscoalition.org/wp-content/uploads/2022/05/Time-to-Take-Stock-2.1.pdf>

Thank you

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