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INTRODUCTION OF NUVEEN'S NATURE STEWARDSHIP INITIATIVE

- *Economic activity has a direct, and often unpriced effect on global biodiversity.*
- *Given the interconnected nature of biodiversity, Nuveen's nature risk initiative intentionally takes a market cross-section, emphasizing the sectors with the largest negative impacts on nature and the highest potential impact to the value of assets under management.*

NATURAL CAPITAL AND THE FINANCIAL MARKETS

"Our economies, livelihoods and well-being all depend on our most precious asset: Nature."

This was the headline message in a recent review on the economics of biodiversity[1].

It is estimated that US $58 trillion of economic value (just over half of global GDP) is moderately or highly dependent on nature and its related services[2], and that half of the market value of listed companies on 19 major stock exchanges is exposed to material nature-related risks. At the same time, nature-based investment must more than double by 2025 to US $384bn and reach US $674bn by 2050 to meet global goals of limiting climate change to below 1.5°C, halting biodiversity loss and achieving land degradation neutrality[3]. The economic benefits nature provides, known as ecosystem services, are crucial to our livelihoods. They provide natural capital like clean air and water, healthy soil, raw materials, pollination, and ingredients in life saving medicines.

[1] The Economics of Biodiversity: The Dasgupta Review, final report, August 2021
[2] Half of the World's GDP Moderately or Highly Dependent on Nature, WEF, January 19, 2020
[3] United Nations Environment Programme (2022). State of Finance for Nature 2022

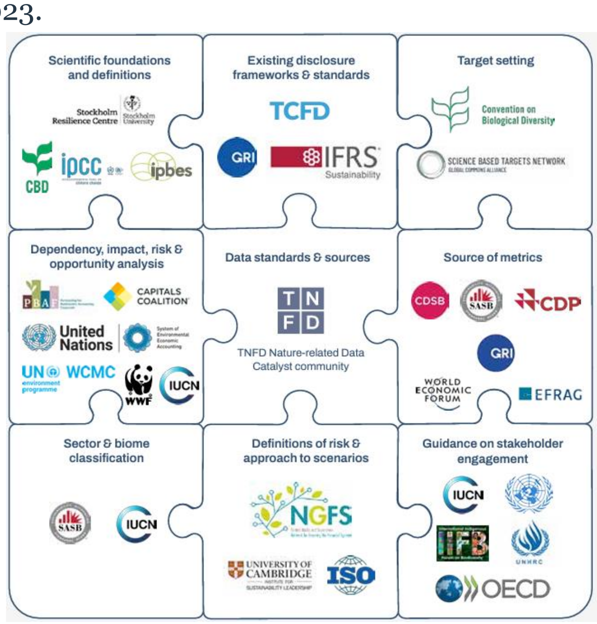
The valuation of natural capital in financial markets is not well understood, and biodiversity is likely not accurately priced in the market currently. Meanwhile, economic activity has a direct, and often unpriced, effect on global biodiversity. Climate change has garnered global action and attention, but the physical risks associated with climate change represent only a portion of the overall risks associated with biodiversity loss. The world has experienced an average decline of 69% in species populations since 1970 in what has been labeled the sixth mass extinction event[4]. Reversing biodiversity loss requires timely and costly action while the restoration and protection of existing natural capital is still possible. Integrating the full scope of nature risk into financial markets is likely to affect corporate valuations in both equity and fixed income holdings, commodity prices and real assets values, as well as sovereign debt in relation to country-level economic activity.

One reason for the lesser focus on biodiversity relative to climate change is that nature and biodiversity loss are not as easily quantifiable. As opposed to having one main driver, in climate and GHG emissions, the biodiversity crisis is driven by many externalities. The UN Environment Program (UNEP) and Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) have established five key drivers of biodiversity loss globally: land and sea use change, invasive species, climate change, direct exploitation of natural resources, and pollution/waste. These are not independent but rather influence and exacerbate each other.

An often-cited example of the crisis has been palm oil. Demand for the agricultural commodity used in consumer goods, food, cooking oils, and biofuels has driven deforestation and land conversion, in turn driving climate change and loss of ecosystems in key biodiverse areas which ultimately. However, there is a disconnect between financial exposure, nature dependencies and stakeholder impacts. Investment in listed companies directly engaged in palm oil production account for a small fraction of most institutional investments yet are often outsized drivers of institutions exposure to nature risk and deforestation.

ADVANCING FRAMEWORKS AND DISCLOSURES

The ratification of the Global Biodiversity Framework at COP15 in 2022 was a landmark global agreement to guide global action on nature protection through to 2030. It quickly gained momentum from agreement to action with the release of the final recommendations from the Taskforce on Nature-Related Financial Disclosures (TNFD) in 2023.



Source: TNFD

[4] World Wildlife Fund's (WWF) Living Planet Report 2022.

While the TNFD framework is intended to provide a common standard for disclosing nature-related risk, the current state of investment-relevant information is captured through a mosaic of voluntary and regulatory reporting regimes, with many gaps remaining. For example, only 8.3% of companies in the MSCI ACWI currently disclose information on pollutants released to soil (one of TNFD core disclosure indicators), compared to 80.6% reporting GHG emissions[5]. Additionally, just 10 companies of the 2,300+ requested to disclose against all three CDP questionnaires related to climate, water, and commodities usage earned a triple A score.

Overall, there is much development still required to create a consistent, comparable, and reliable set of disclosures that can support integration of nature-related dependencies and impacts into investment decision-making.

Notwithstanding the nascent state of current disclosures, 320 firms (178 companies) committed to disclose TNFD-aligned reporting within the next two years[6] and 86% of firms that responded to a survey from TNFD planned to align with the framework by 2026.[7]

SEPARATING THE FOREST FROM THE TREES

Assessing the investment implications of nature-related impacts and potential company- or portfolio-level solutions requires a multi-dimensional approach. Investors must understand value chains from raw materials to final products and market forces that may influence competitive dynamics. Key risk factors to consider include:

Risks	Impact Examples
Physical risks	• Continued viability of farmland, timberland, waterways
Transition risks	• Shifts in demand and consumer preferences for more sustainable products. • Technology innovations, alternative inputs and processes
Regulatory risks	• Border adjustment mechanisms, import bans • Restrictions on use of natural resources • Remediation costs for environmental incidents
Reputational risks	• Brand damage and stakeholder scrutiny for controversial practices

As an entry point to the multi-faceted review, the market has focused on the five IPBES key drivers of biodiversity impacts. Given the likelihood of data availability and actionability, we believe that three of the driver's land use change, pollution, and use of natural resources have the most opportunity to be addressed by the private sector including through investor influence.

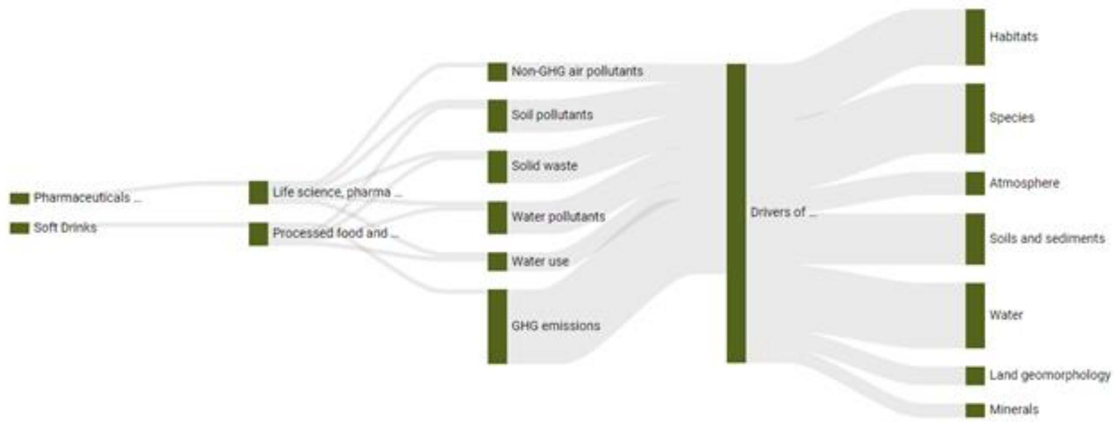
IMPACT DRIVERS OF BIODIVERSITY LOSS BY SECTOR

	Land Use Change	Natural Resources	Pollution/Waste		
GICS Sector	Terrestrial Ecosystems	Water Use	Solid Waste	Soil Pollution	Water Pollution
Consumer Staples	High	Very High	High	Medium	Medium
Healthcare	High	High	Medium	Medium	Medium
Consumer Discretionary	High	High	Medium	Medium	Medium
Industrials	High	High	Medium	Medium	Medium
Materials	Very High	Very High	High	High	Medium

[5] Goldman Sachs Global Investment Research, TNFD releases recommended disclosure metrics, April 2023
[6] TNFD, List of Early Adopters, January 2024
[7] TNFD, Getting started with adoption of the TNFD recommendations, September 2023.

Source[8]

Impact drivers can be categorized and assessed individually, but the real-world impacts to nature are often interconnected. The three key drivers align with five of the eleven impact drivers classified by the natural capital protocol.[9] In the example below, soft drinks and pharmaceuticals industries have limited overlaps in their value chain. A traditional ESG materiality assessment typically would have limited overlap in key performance indicators. However, the production processes have overlapping uses of natural capital that have cumulative effects on a variety of impact drivers of biodiversity loss.



Source[10]

Unlike climate-related assessments that can focus primarily on GHG emissions and the companies most responsible for their production, nature risks require both casting a wider net and diving deeper into the industry and value chain-specific factors resulting in nature impacts. This requires investors to map sectors, subsectors and production processes to their dependencies and impacts on nature.

PORTFOLIO ANALYSIS AND SELECTION PROCESS

"We are raising expectations for 50 companies exposed to significant nature-related financial risks that comprise nearly one-quarter of the calculated direct impacts to nature attributed to Nuveen's enterprise corporate holdings."

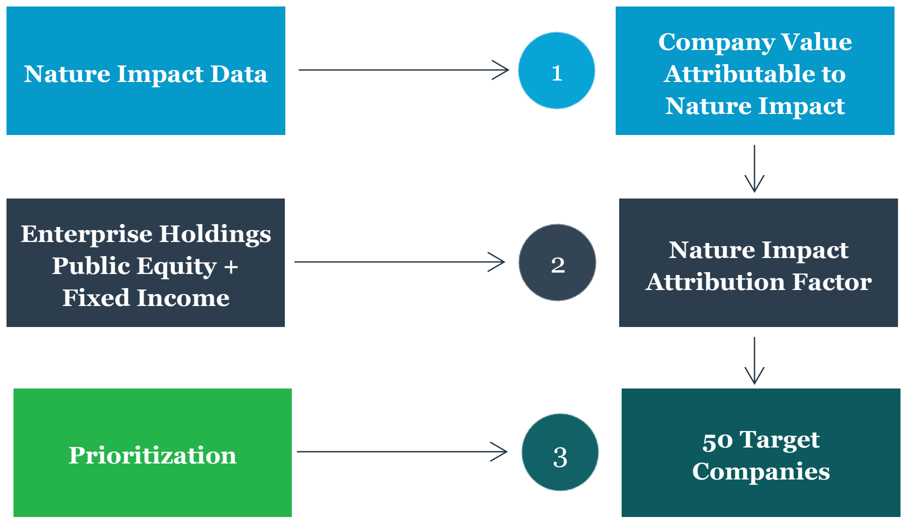
To be consistent and objective with our stewardship focus, we followed the Partnership for Biodiversity Accounting Financials standard to the greatest extent possible by translating the IPBES key drivers into the following biodiversity impact themes that could be approximated through available company and third-party ESG data sources:

- Use of natural resources
- Land use change
- Waste/Pollution

[8] ENCORE Impact Data
[9] https://capitalscoalition.org/capitals-approach/natural-capital-protocol/?fwp_filter_tabs=guide_supplement
[10] Encore natural capital dependency and impact flows

Nuveen followed a three-step process to establish the appropriate set of target companies:

1. **Quantification:** assessment of the proportional amount of company revenue derived from business activities that have a material impact on land use, water use, and pollution to create a single and comparable value for nature impact
2. **Attribution:** attribution analysis based on the proportional nature impact attributable to our ownership in the company
3. **Prioritization:** selection of the 50 companies with the largest nature impact attribution across 16 different industries.



Source: Nuveen, FactSet and MSCI. Company target universe determined using Nuveen AUM and company EVIC data as of 30 Sep 2023. Target universe determined from all Nuveen public holdings excluding companies where Nuveen is solely a debt holder; there is no publicly traded corporate parent entity; company revenues are zero or negative. Utilizes MSCI estimations for the percent of business activities that are involved in high- or medium-risk activities with impacts on land, water, and waste generation. Other considerations for inclusion: removal of companies within energy and utilities sectors given overlap with in-progress engagement activity focused on the climate transition; sector- and industry-level caps to ensure cross-sectional representation; removal of companies where value attributable to nature impact did not reach a risk profile within the top quintile notwithstanding the revenue-based multiple. Overall,16 companies were removed for industry-based considerations and 9 were removed for risk-profile considerations from the initial list of companies with the highest nature impact attribution to Nuveen. When a company was removed, the next highest assessed company was screened based on the same criteria and the process continued until there were 50 companies meeting all eligibility criteria.

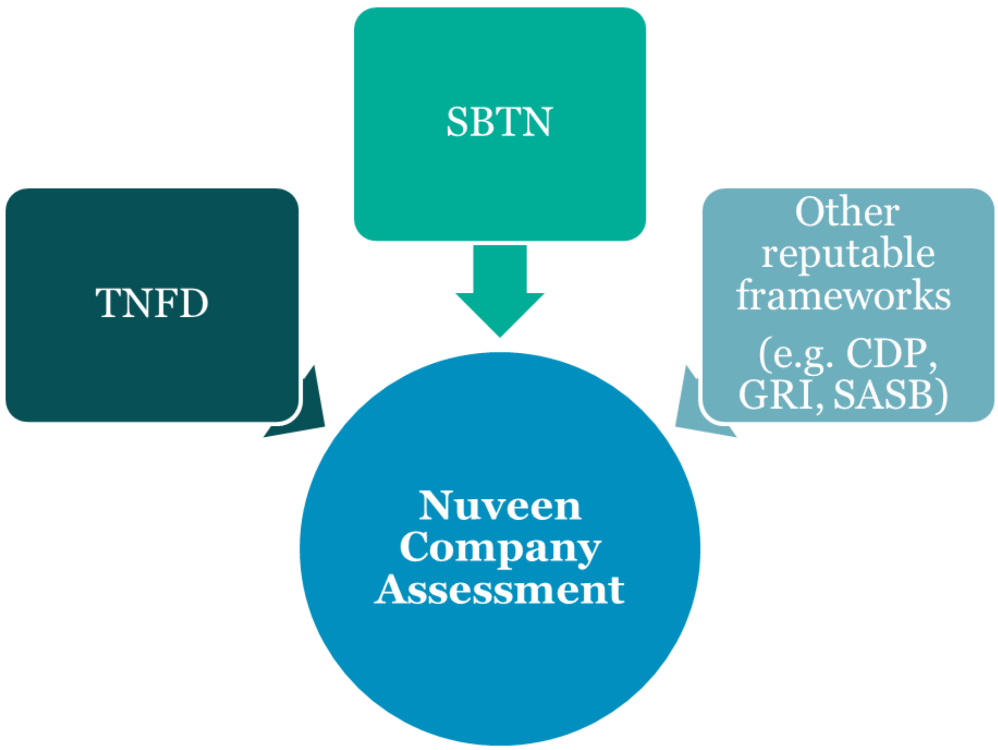
Below we provide a breakdown by sector and region of the companies in this targeted initiative.

	Sector					
Region	**Consumer Discretionary**	**Consumer Staples**	**Health Care**	**Industrials**	**Materials**	**Grand Total**
Asia/Pacific	1	-	-	-	2	3
Europe	1	5	-	-	3	9
USA & Canada	3	15	2	2	13	35
LatAm & Caribbean	1	-	-	-	2	3
Grand Total	**6**	**20**	**2**	**2**	**20**	**50**

ASSESSMENT FRAMEWORK CONSTRUCTION

Nuveen's initial biodiversity stewardship initiative is focused on promoting transparency and consistency in nature-related disclosure. While keeping to the overall framework of TNFD, we have focused on company alignment to science-based targets network (SBTN) guidance and sourced the various ESG reporting standards for industry-relevant KPIs that have general market acceptance.

We believe this approach strikes the appropriate balance of supporting market coalescence on disclosure expectations; offering companies specific guidance and efficient pathways for reporting; and providing indicators of potential investment opportunities in circularity, waste management, and natural resources solutions.



NATURE ASSESSMENT FRAMEWORK

Nuveen relies upon its transparency, accountability, and impact framework to guide its assessment of company maturity on ESG themes and identify areas to use stewardship to achieve positive outcomes.

While our framework is not a turnkey solution for an ESG score or nature-branded product, we believe it appropriately captures the balance of materiality and feasibility in working with companies toward nature-positive solutions that will support long-term investment goals.

The framework helps align our expectations from a company reporting standpoint with key performance indicators that can help guide us in identifying de-risked investment opportunities or emerging investment solutions such as:

- De-risking operations and supply chains through more effective use of rare earth minerals or toxic chemicals;
- Operational efficiencies from circularity approaches from reuse and recycle of natural resources, for example water in heating/cooling and fibers in packaging materials;
- Competitive advantages from use of sustainable and renewable materials in products;
- Long-term return improvements from remediation of natural resources, such as increase crop yields from regenerative agricultural practices.

Below we provide a snapshot of how we are assessing company maturity on nature reporting and their opportunities to enhance or protect natural capital:

TRANSPARENCY: Basic disclosure items.

Materiality of Nature	Land Use	Natural Resource Use	Pollution/Waste	Stakeholders
• Board approved strategy • TNFD Disclosure • Locates nature dependencies and impacts (LEAP) • CDP reporting	• Total spatial footprint • Land use change • Operations in key biodiverse areas	• Sustainable sourcing of high-risk natural commodities • Raw materials inputs verified by third party certification • Freshwater use	• Solid waste generation and disposal • Soil pollution • Plastic use • Wastewater	• Disclosure of engagement process • Locates key local communities and groups particularly Indigenous Peoples

ACCOUNTABILITY: Strategy/plans for risk management.

Land Use	Natural Resource Use	Pollution/Waste	Stakeholders
• Land targets (No Conversion, Footprint Reduction, Zero deforestation etc.) • Remediation and restoration goals	• Water use reduction ad restoration goals • Goals to increase sustainably sourced commodities/materials	• Wastewater strategy • Soil health protection policies • Waste reduction targets and circularity strategies • Single use packaging and plastic goals	• Human Rights Policy and Stakeholder Engagement Strategy • Established grievance mechanisms to report ecological concerns and responses to specific issues

IMPACT: Materialization of plans

Realized Nature Impact Reductions

- Limit or mitigate natural asset degradation and/or actively improve the value of natural assets

LOOKING AHEAD: NATURE AT THE FOREFRONT

We believe it is imperative to understand the risks and opportunities associated with a greater emphasis on natural capital considerations in investment processes. Regardless of whether the market establishes a commoditized price on clean water, healthy soil, or diverse ecosystems, we believe biodiversity will be financially material at both the company- and portfolio-level. The value of natural capital may never be fully internalized in business activities, but companies that are able to de-risk operations from the physical risks of biodiversity loss or offer solutions to restore biodiversity are likely to create long-term value.

Company dependencies on natural capital are more likely to have short-term effects on valuations, but over the long-term dependencies will likely catalyze solutions while impacts will likely face disruption from either private sector solutions or public sector regulation. Therefore, we believe that in the long term it is imperative to address both dependencies and impacts through responsible investing practices.

This includes the activity of our initial nature risk initiative to be at the forefront of the market discussion of quality nature-related disclosures, hold companies accountable to their commitments to appropriately valuing natural capital, and catalyze the market to integrate a value for nature that will support long-term, sustainable business operations.

For more information, please visit us at nuveen.com.

Endnotes

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