

# Investors Can Assess Nature Now

(ICANN)

A guide to assessing  
water and deforestation  
issues in investment portfolios



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# Foreword by CEO

Welcome to **Investors Can Assess Nature Now (ICANN)**, a First Sentier Investors guide for investors to better identify and assess materiality, exposure and responses to nature-related issues, to be used in company engagement and disclosure.



Around the world, we are witnessing growing momentum to address biodiversity loss. In 2022, we saw the adoption of the Global Biodiversity Framework at the UN Biodiversity Conference (COP 15), where world leaders made a landmark commitment to protect nature and biodiversity. Governments also agreed to start negotiating a new global treaty to end plastic pollution and investors are anticipating the launch of the Taskforce on Nature-related Financial Disclosures (TNFD)'s final recommendations.

Yet the topic of nature and biodiversity is still relatively new for many investors, and existing guidance on assessing and prioritising nature-related issues is still in its infancy. Since the beginning of our own journey on this topic, we have developed practical ways to understand nature-related investment risks, specifically in the areas of freshwater and deforestation. We learned many lessons during this process and thought it would be valuable to contribute to the broader discussion on this topic by sharing our insights, approaches and resources.

The interconnected nature of some of the most complex global issues of today, including biodiversity, climate change and human rights, means that collaboration is critical for investors. We must work together to build our knowledge capital, better position ourselves to manage such risks, and ultimately drive a shift in financial flows towards a more nature positive economy. This guide is our invitation to work together, and to continue discussing emerging solutions and addressing challenges.

As the name of our guide suggests, investors can assess nature, despite not having the perfect tools, and it can start now.

**Mark Steinberg**  
Chief Executive Officer

# About our guide

This guide, titled “Investors can Assess Nature Now” (ICANN), builds on First Sentier Investors’ work to create an internal toolkit (“Nature and Biodiversity Toolkit”) for its investment teams, aiming to demonstrate that financial institutions can start conducting sector-level and company-level assessments on key topics like freshwater and forests.

During the process of developing our own toolkit, we heard from many investors and peers that even though they are interested in working on this topic, they are not sure where to go, what to look for, or how to use existing resources.

With that in mind, we wanted to share a step-by-step guide that references data resources that can be used at each stage to make it easier for investors to understand which tools and databases can support their analysis. The objective of this guide is not to showcase our own exposure and assessment results or to provide further rationale for our investment policies related to nature. Rather, we hope to improve nature data and disclosure, and accelerate industry practice through collaboration and sharing our learnings.

## This guide outlines:

Why nature and biodiversity should matter to investors

FSI’s roadmap for addressing nature-related risks and impact drivers, including our work to date

A toolkit that maps out our approach to identifying nature and biodiversity-related risks and developing engagement approaches

How we intend to move forward in this focus area

A suggested use case for investors to consider when preparing for their own nature-related risk assessment, due diligence and engagement, as a starting point for disclosures aligned to the framework outlined by the TNFD.



By using this guide, investors can deepen their understanding on this important topic and start mapping their risks and exposure, with the goal of having more targeted engagement discussions with their investee companies.

This guide is not a one-size-fits-all solution. Barriers may be encountered, but we encourage investors to follow the steps and explore the tools and databases focusing on water and forests first, so that they can develop their own approach to assessing nature more broadly. First Sentier Investors welcome opportunities to collaborate and share experiences with peers as part of our journey.

1. This toolkit was launched internally in May 2023, following a collaboration between FSI’s Responsible Investment team and some of its investment teams, as members of the Nature and Biodiversity Working Group. Since its launch, the toolkit has been further refined and with a small number of investment teams commencing implementation. It is available to all teams if they choose to conduct research/engagements on this issue.

# Executive summary

Nature and biodiversity is under threat like never before. Climate change, exploitation of natural resources and human-use of land and sea have contributed to a devastating 69% drop in wildlife populations over the last 50 years<sup>2</sup>.

As the foundation of our economy, society and life itself, biodiversity supports all life on our planet. Yet it is eroding at a pace that is severely damaging the natural ecosystems that provide us food, water and clean air, posing a large risk for investors. Investee companies not only directly and indirectly impact nature and biodiversity through their operations and value chain, they are dependent on it. Companies

that fail to adequately identify and manage their impacts and dependencies in relation to nature and biodiversity could face financial, reputational, legal and other consequences.

At First Sentier Investors (FSI), we believe biodiversity loss and land degradation is financially material, and addressing it is crucial to achieving a net zero and climate resilient future. Following internal discussions to better understand nature-related risks, dependencies and impacts within our investment portfolios, we developed a framework for a toolkit to support our investment teams with company prioritisation, assessment and engagements.

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**Focus areas of our assessment and engagement framework**

Steps in the guide	<p><b>1</b></p> <p><b>Sector-level assessment of exposure, dependency and impacts</b></p>	<p><b>2</b></p> <p><b>Company prioritisation and assessments</b></p>	<p><b>3</b></p> <p><b>Company engagement on material issues</b></p>
Highlights	<p>Sector materiality assessment using a Sector Materiality Tool or a Heatmap is helpful to identify priority sectors for targeting and to understand material nature pressure areas.</p>	<p>Using sectoral assessment results and other metrics on nature, a set of priority companies can be identified. For company-level analysis, due diligence should consider 'location' and 'supply chain'.</p>	<p>Improved nature-data disclosure and transparency is an important objective for company engagements. Engaging with companies on nature after an assessment can help identify areas where investors can drive positive outcomes by sharing best practice with investee companies and linking solutions and innovative players.</p>

FSI's work on nature initially focuses on water and deforestation, given our investment exposure (sectors with high impacts and dependencies on freshwater and forests) and the importance of these biomes and the ecosystem services they provide. The results from the Sector Materiality mapping showed that our listed equity holdings have high impacts to climate change, land use and water use.

This guide suggests accounting for water dynamics as well as supply chains and local contexts in company assessments. It is also important to understand and assess water risk and water intensity – one may be more relevant to another, depending on the company’s sector, business model, and sourcing location for water.

Our deforestation assessment and engagement framework has five key pillars: traceability and transparency; sourcing; monitoring; policies and pledges; and disclosure. For companies in high forest risk sectors, the guide suggests defining the three most relevant commodities per company (i.e. commodities that contribute the most to a company’s revenue), then going up the supply chain and mapping company activities to specific locations, in order to track where and how deforestation takes place. This approach also applies to companies using water intensive commodities as direct input to their business.

We recognise that access to nature-related data can be challenging. It can be inaccurate, complex and not standardised. This is especially the case when seeking detailed commodity-related data at the country- or sector-level, which is either unavailable or in the development phase. However, there are good and accessible nature data resources available and we have sought to highlight these throughout this guide.

Finally, this guide encourages investors to take a broad view of biodiversity and nature in the context of climate change and human rights abuse, as these issues are intertwined, and at times there may be trade-offs. The intersection of some of the data points in our assessments will help us to deepen our knowledge in these areas.

Investors can identify new opportunities to understand investor’s risk and dependency on nature by understanding exposure to water and deforestation, mapping various data points to holding companies, assessing priority companies in depth, and engaging with companies on material issues and gaps.

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# What is nature and biodiversity and why it matters to investors

**Nature and biodiversity are terms that are often used interchangeably, but they are not one and the same: each has a distinct meaning and implications.**



Nature is defined by the TNFD<sup>3</sup> as “the natural world, with an emphasis on the diversity of living organisms (including people) and their interactions among themselves and with their environment” and exists across four realms: land, ocean, freshwater and atmosphere.



Biodiversity is defined by the Taskforce on TNFD<sup>4</sup> as “the variability among living organisms from all sources, including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems”. Biodiversity can be thought of as a characteristic of nature, just as portfolio diversification is a characteristic of investment portfolios.

Nature and biodiversity matter to investors because the very companies we invest in not only impact, but *truly depend* on nature; yet we increasingly see a rapid loss of nature and biodiversity. Biodiversity conservation and climate action are intrinsically linked. As the planet’s best defence against climate change, it is important that investors consider biodiversity and nature’s protection in meeting net zero targets and building a more climate resilient future. The Living Planet Index<sup>5</sup> tracks populations of mammals, birds, fish, reptiles and amphibians, recently revealing an average 69% decrease<sup>6</sup> in monitored wildlife populations since 1970.

The Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES)<sup>7</sup> identifies five key

pressures as the greatest contributors to the loss of nature globally (see Table 1). **Understanding how business activities contribute to these pressures, both directly and indirectly, is therefore crucial.**

To exemplify the difference between a direct and indirect contribution through operations and value chain, a direct contribution could be an oil spill polluting ocean and disturbing marine and coastal biodiversity, whereas an indirect impact could be new infrastructure pathways inadvertently introducing invasive species and diseases. Such impacts can be different across the value chain of a company, between upstream, direct operations and downstream.

<sup>3</sup> Taskforce on Nature-related Financial Disclosures (TNFD), 2023: [TNFD's Definitions of Nature](#)

<sup>4</sup> Ibid.

<sup>5</sup> WWF, 2022: [Living Planet Index](#) is a comprehensive study of trends in global biodiversity and the health of the planet, which tracks populations of mammals, birds, fish, reptiles and amphibians, published biannually.

<sup>6</sup> Monitored freshwater populations have seen an alarming decline of 83% since 1970.

<sup>7</sup> Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), 2019: [Global Assessment Report on Biodiversity and Ecosystem Services](#)

Table 1

Key pressures (impact drivers)	Pressure category
Land/Water/Sea Use Change	Terrestrial ecosystem use
	Freshwater ecosystem use
	Marine ecosystem use
Resource exploitation	Water use
	Other resource use
Climate Change	GHG emissions
Pollution	Non-GHG air pollutants
	Water pollutants
	Soil pollutants
	Solid waste
Invasion of alien species	Disturbances
	Biological alterations/interferences

On the other hand, the goods and services provided by nature (whether captured by our economic system or not) are major contributors to our economy. Disruptions to the ecosystem such as destruction of habitats, overexploitation of natural resources and pollution therefore disrupt the balance of nature, impacting food security, production of goods and supply chains.

The companies that we, as investors, invest in also depend on nature and the value and benefits it provides - even if aspects, like clean air, cannot be priced in an economic sense. An example of this is how the decline of insect populations may impact the

natural pollination services available to pollinate cocoa crops, leading to loss of yield quantity and quality for a confectionery company, because its business depends on the ecosystem service (pollination) provided by insects.

For some companies, impacts and dependencies are two sides of the same coin. Fast food restaurant companies procure and use beef, wheat, soy and paper in their businesses, which means such a company depends on stable, quality supplies of such soft commodities. But because of this dependency, the company may also have impacts on deforestation, not directly but through its supply chain.

Our understanding of nature-related risks, opportunities, impacts and dependencies is becoming more tangible. Disclosure frameworks, target-setting and impact-measuring methodologies are being developed, and nature-related data is also evolving quickly. Building on this momentum, regulators and policymakers around the world are increasingly demanding that investors understand and disclose these issues. For example:

- The French Energy-Climate Law Article 29 requires companies and financial institutions to disclose biodiversity risks and impacts. In 2020, France also became the first country in the world to pass legislation requiring all new domestic washing machines to have a microfibre filter fitted, as standard, from the beginning of 2025.
- ‘Biodiversity sensitive area’ and ‘emissions to water’ indicators in the Principal Adverse Impacts

of the EU Sustainable Finance Disclosure Regulation (SFDR) require disclosure for Article 8 and 9 funds.

- The European Union (EU) banned imported goods that contribute to deforestation or are produced in deforested lands, to encourage companies to better understand this issue. The European Parliament approved Deforestation-free Supply Chain law came into force in June 2023 and is applicable to a list of forest-risk commodities (including palm oil, beef, timber, coffee, cocoa, rubber and soy). For these commodities to be exported to the EU, companies must produce a due diligence statement to identify their source and verify that it is not produced from crops grown on land deforested after 2020<sup>8</sup>.

## Why nature matters to investors



Investors need well-functioning economies and societies to create stable markets. **Given our economies are dependent on nature and we cannot get to net zero without nature, it is in investors’ interests to limit nature loss and protect the ecosystems.**

- We have lost a lot of nature already due to overexploitation, habitat destruction, land conversion, pollution and climate change, while our economic activities continue to leave a negative footprint on nature. Investors must not only consider the financial materiality of nature loss to investment but also the negative and positive impacts of investments on environment and societies. This concept is known as ‘double materiality’.
- Our economies are dependent on nature. Nature losses can disrupt companies and

industries, thus it is important for investors to consider nature-related risks in assessing financial performance of investee companies (e.g. decrease in bee population leading to reduced pollination and a crop yield). Companies that fail to adequately identify and manage their impacts and dependencies in relation to nature and biodiversity could face financial, reputational, legal and other consequences. This includes both physical and transition risks: physical risks increasing because we’ve already done so much damage to nature loss (and heightened by climate change); and transition risks increasing as regulations and disclosure frameworks emerge.



# First Sentier Investors’ work on nature and biodiversity

Nature and biodiversity are the planet’s strongest natural defence against the impacts of climate change. At FSI, we are long-term and responsible investors with a belief that biodiversity loss and land degradation is financially material, and that preserving our natural resources is critical to achieving a net-zero and climate resilient future.

This section introduces FSI’s roadmap for addressing nature-related risks and impact drivers, including our work to date, a toolkit that we are currently focusing on that maps out how investors and companies can identify and nature and biodiversity-related risks as well as developing engagement approaches, and how we intend to move forward in this focus area.

## Our work on nature and biodiversity to date

- Biodiversity as responsible investment focus area
- Establishment of the FSI-MUFG Sustainable Investment Institute
- Plastic pollution engagement

## Nature and biodiversity toolkit

- Nature and biodiversity working group focusing on freshwater and forests
- Toolkit for sector- and company-level assessment and engagement

## Way forward

- Finance for Biodiversity delivery
- Targeted engagement
- Biodiversity research

# 1. Our work on nature and biodiversity to date

FSI expanded the focus of our Responsible Investment agenda to include Nature and Biodiversity in 2020, alongside our other focus areas of Climate Change, Human Rights & Modern Slavery and Diversity.

Since then, we tried creating a knowledge base for our staff through informal training sessions and particularly for our investments the aim was to deepen their understanding of the nature-related risks, dependencies and impacts of the companies we invest in, particularly in the areas of water, deforestation and plastic pollution. Our investment teams now have increased access to relevant data to assess their exposure to these issues, and some have identified key areas and questions to ask investee companies to improve their understanding in company practices during engagement.

We have established a First Sentier MUFG Sustainable Investment Institute that researches and publishes reports on sustainable investment-oriented issues including microplastic and microfibre pollution.

We also convened a *Nature and Biodiversity Working Group* in 2022, comprised of members from nine of FSI's fifteen investment teams. In this Working Group we assessed sectoral water and deforestation risk and developed a framework for company engagement. A key output of this group is the delivery of a Nature and Biodiversity Toolkit that provides a framework for assessing and engaging with investee companies on nature-related issues for our investment teams.

As members of the TNFD Forum, we support a shift in financial flows towards nature-positive outcomes in following the development of target-setting methodologies and metrics by the TNFD and Science Based Targets Network (SBTN). We are also a signatory of the Finance for Biodiversity Pledge, an agreement initiated by a group of financial institutions calling for global leaders to protect and restore biodiversity through their finance activities and investments.



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**As members of the TNFD Forum,  
we support a shift in financial flows  
towards nature-positive outcomes**



## 2. Our current focus: A Nature and Biodiversity Toolkit

### Focus on freshwater and forests

In 2022, we set up a *Nature and Biodiversity Working Group*, comprising members from our investment teams globally, convened by the Responsible Investment (RI) Team. The main task of this working group was to develop a Nature and Biodiversity Toolkit to support investment teams to:

- Understand nature & biodiversity and its relevance to their investments
- Identify and assess nature and biodiversity-related exposures on a sector- and company-level
- Develop nature & biodiversity engagement approaches

TNFD's fundamental approach to understanding nature starts with identifying the four realms of nature: land, freshwater, ocean and atmosphere. Of these, we decided to focus on freshwater and forests (of various land biomes) in the first edition of the toolkit, based on the following considerations:

## Freshwater



Of all the impact drivers and pressures that contribute to nature loss, the quantity and quality of freshwater is a key indicator of resource exploitation and pollution<sup>9</sup>. It is critically linked to the effects of climate change, making it a material pressure<sup>10</sup>. Water is also a vital factor for production, economic growth, health and wellbeing. Surface water resources found in rivers, streams, creeks, lakes, and reservoirs are often used as drinking water, and also in agriculture and recreation. Groundwater accumulates from rain precipitation that has seeped into the ground and collects in a body of rock or sediment, known as

aquifers. Industries such as manufacturing, mining, oil and gas, energy generation, engineering, and construction withdraw and consume large volumes of groundwater in their production processes.

The interaction between surface and groundwater in terms of the water cycle is critical for businesses that depend on water resources given water recharge rates and flow speed differs, and over-withdrawal of groundwater exceeding the amount of recharge into an aquifer can cause depletion.

## Forests



Forests play an important role in climate change mitigation, absorbing one-third of the carbon dioxide released from burning fossil fuels every year. Yet tropical forest deforestation related to 'forest-risk' agricultural commodities (such as palm oil, soy, beef, pulp and paper) accounts for 8% of all CO<sub>2</sub> emissions<sup>11</sup>, more than the emissions produced by the EU as a whole. Adding to this, part of the Amazon rainforest is emitting more carbon dioxide than it can absorb due to deforestation<sup>12</sup>. Deforestation of the Amazon threatens its ability to generate its own rainfall, thus affecting the water cycle and agricultural activities in the region.

Deforestation is a key driver of nature loss, directly linked to land use change (for example, loss of natural forest resulting from land conversion to agriculture or other non-forest land use) and resource exploitation, and indirectly to pollution and biological alterations /interferences<sup>13</sup>. Direct drivers of deforestation include agricultural expansion, extraction industries and human settlement-related activities such as transport, urbanisation and other infrastructure projects.

More practically, there are additional data, tools and methodologies to assess water and deforestation-related issues on a portfolio-level compared to other topics such as waste or marine species protection currently, which makes them more addressable and actionable by investors.

<sup>9</sup> Science Based Targets Network (SBTN), February 2022: [SBTN's Sector Materiality Tool](#). Following guidance from this tool as recommended by the TNFD Beta Framework v0.3

<sup>10</sup> Most financial institutions and companies that analysed their dependence on ecosystem services found that they have the highest dependency on the provision of groundwater and surface water. Such analysis often finds there is high dependence on water because it provides fundamental services to the production of goods.

<sup>11</sup> United Nations Framework Convention on Climate Change (UNFCCC), November 2022: [Financial Sector Commitment Letter on Eliminating Agricultural Commodity-Driven Deforestation FAQ \(COP27\)](#)

<sup>12</sup> National Public Radio (NPR), 2021: [Parts Of The Amazon Rainforest Are Now Releasing More Carbon Than They Absorb](#)

<sup>13</sup> SBTN, supra note 8.

## Assessment and engagement framework

The approach provided in the FSI’s toolkit starts with sector- and company-level assessment followed by company engagement on material issues. We suggest reporting on the outcome of engagements and monitoring progress made by companies. The following explains each step in more detail.



### Step 1: Identify Material Sector Exposures

The TNFD has developed an initial list<sup>14</sup> of priority sectors and industries that are more likely to be financially impacted than others due to their exposure to dependencies and impacts on nature. It also considers each sectors’ potential opportunities,

including activities that create positive outcomes for organisations and nature by either avoiding or reducing negative impact on nature, or contributing to its restoration. This list includes 8 thematic sectors, 13 sub-sectors<sup>15</sup> and 19 industries, to be prioritised for the TNFD’s initial development of sector-specific guidance.

Thematic sector	Sub-sectors
Food and Beverage (F&B)	Food sector, Food beverage and retail
Renewable Resources and Alternative Energy	Forestry and Paper, Alternative energy (biofuels)
Infrastructure	Infrastructure, utilities
Extractive and Minerals Processing	Construction Materials, Metals and Mining, Oil and gas
Health Care	Biotechnology and Pharmaceuticals
Resource Transformation	Chemicals
Consumer Goods	Apparel and Textiles
Transportation	Marine Transportation

<sup>14</sup> [TNFD Beta Framework v0.2](#) (June 2022) TNFD, June 2022: [TNFD Beta Framework v0.2](#)

<sup>15</sup> The financial sector (including the asset management industry) is also considered material, and there will be separate guidelines prepared by the TNFD in September 2023.

## Water



Sectors<sup>16</sup> with the most critical impact on the quantity and quality of water include:

- Food and beverage
- Power generation
- Mining
- High tech
- Pulp and paper
- Apparel and textiles
- Healthcare.

**It is important to understand what type of water risk matters more for the chosen sector whether it is flooding, water scarcity and drought, or water quality<sup>17</sup>.** While most sectors

with physical assets, such as real estate and infrastructure, are vulnerable to flooding risk caused by storms, other sectors can be sensitive to quality of water such as in textiles and fashion, food, pharmaceuticals and semiconductors. Sectors<sup>18</sup> that require the use of water directly for their business are more sensitive to water scarcity risk. For example, the agriculture sector is dependent on water to grow food and other commodities, such as cotton. It can also be a direct ingredient (e.g. beverage companies), part of the cooling process (e.g. power generation or pharmaceuticals), or part of the manufacturing process (e.g. making pulp or refining metals).

## Deforestation



The most material agriculture-driven soft commodities with the highest forest-risk contributing to deforestation<sup>19</sup> (as identified by the Global Canopy's Finance Sector Roadmap) are:

- Soy
- Beef (cattle)
- Leather
- Palm oil
- Timber
- Pulp and paper.

Sectors that are dependent on these high forest-risk soft commodities include:

- Agricultural products;
- Packaged foods and meats
- Retailing
- Consumer services like restaurants
- Household and personal products
- Consumer durables and apparel

- Materials (packaging, paper products, etc.)
- Automobiles and components
- Biofuels and biomass.

**Companies that produce or process forest-risk commodities, financial institutions that procure forest-risk products, or organisations that lend to or invest in these activities and commodities, can all be considered exposed to agriculture-driven<sup>20</sup> deforestation risk.**

Once key sectors that depend heavily on nature have been identified, the next step is understanding the exposure of investments to these sectors. This can be done by mapping International Securities Identification Numbers (ISINs) to industry codes and calculating AUM exposure per material sector. A more detailed approach to prioritise companies is explained in the *Spotlight: Assessing sector materiality of FSI's equity investments*.

<sup>16</sup> Carbon Disclosure Project, 2023: [CDP's Water Impact Index](#), which ranks over 200 industrial activities within 13 industry sectors according to their potential impact on water resources, we can understand which sectors have more impact on water quantity and water quality. This can be used as a proxy for water risk, because higher negative impact on water quality (e.g. wastewater discharge in river bodies) could signal higher water quality risk for a company.

<sup>17</sup> WWF, 2020: WWF, 2020: [Water Risk in the Mining Sector report](#); WWF, 2021: [Diagnosing Current and Future Water Risks Facing the Pharmaceutical Sector](#); WWF, 2021: [Tackling Growing Water Risks in the Food Sector](#)

<sup>18</sup> Aquanomics, 2022: [The economics of water risk and future resiliency](#) For more information on how different water risks affect agriculture; banking and insurance; energy and utilities; fast-moving consumer goods (FMCG) and retail; and manufacturing and distribution sectors, please read the report

<sup>19</sup> FSI's Deforestation Free Finance, 2021: [Global Canopy Finance Sector](#) FSI's deforestation framework is based on this roadmap

<sup>20</sup> Please note that non-agriculture driven deforestation such as via mining or linear infrastructure construction is not the main focus of the assessment, but to be followed up in version 2 of our toolkit.



## SPOTLIGHT: ASSESSING SECTOR MATERIALITY OF FSI'S EQUITY INVESTMENTS

To understand the relationship between our investment holdings and their pressure on nature loss, we used the Sector Materiality Tool<sup>21</sup> developed by the Science Based Targets Network (SBTN) and the United Nations Environmental Programme World Conservation Monitoring Centre (WCMC). The tool presents materiality ratings for 12 pressure categories, themselves grouped by five nature-related issue areas such as land/water/sea use change, resource exploitation, climate change, pollution and invasives. This tool has been recommended by the TNFD for sector-level research and is in line with the Encore<sup>22</sup> tool, which provides information on the materiality of potential impacts and dependencies on a sector-level.

For this exercise, we applied the Sector Materiality Tool to all listed equity companies we invest in, to start mapping our sector exposure to the most material impacts (pressures). We used a 5-point system to translate the materiality scores of Very High (VH), High (H), Medium (M), Low (L) or Very Low (VL). Instead of using the International Standard Industrial Classification of All Economic Activities (ISIC) to map various 'activities'<sup>23</sup> of a company to nature pressure categories, we mapped our holdings using the Global Industry Classification Standard (GICS) which is more sector-based due to data availability issues.

<sup>21</sup> SBTN and UNEP WCMC, [Sector Materiality Tool](#).

<sup>22</sup> Natural Capital Finance Alliance & United Nations Environmental Programme World Conservation Monitoring Centre (UNEP-WCMC), 2023: [Exploring Natural Capital Opportunities, Risks and Exposure](#) (Encore) is a tool to help users better understand and visualise the impact of environmental change on the economy. It was developed by the [Natural Capital Finance Alliance](#) in partnership with [UNEP-WCMC](#)

<sup>23</sup> Due to insufficient data, it is currently challenging to map each portfolio company to a number of production processes and business activities, although such mapping could provide a more granular basis to link business activities to pressures on nature (than sectors).

Using our AUM data as of December 2022, our assessment shows that about 70% of listed equities that we invest in are in sectors with high or very high pressures to nature, through climate change. Another 25% of such listed equities is invested in sectors with high or very high pressure on terrestrial ecosystem use, 16% on water use, and 7% via biological alterations/interferences<sup>24</sup>. This result is using the average pressure score between upstream and direct operations. Material sectors for nature in our AUM include Diversified Metals and Mining, Packaged Foods and Meats and Biotechnology.

**This has been a helpful exercise to identify priority sectors for targeting and to understand material nature pressure areas.** We can use this result to inform us on the linkage between sectors (e.g. Brewers and Distillers & Vinters); typical business processes involved in the sectors (e.g. alcoholic fermentation and distilling); and particular business activities involved in the processes (e.g. distilling, rectifying and blending of sprits, manufacture of

wines, or manufacture of malt liquors and malt); which are both dependent on, and impacting, nature in different ways (leading to different pressure areas). We have disclosed further analysis from the use of the Sector Materiality Tool in our 2022 Responsible Investment Report, which is available on our website.

For our listed equity holdings, we also developed a heatmap assessment based on the same data, as recommended in the TNFD's additional guidance on assessing risks. The below table<sup>25</sup> shows the top 15 sectors mapped with pressure data provided by the Sector Materiality Tool. Using the same data from the Sector Materiality Tool, this exercise provided additional insights on key sectors with the most dependencies and impacts on nature, presented in pressure categories. Our listed equity holdings in these sectors have relatively high dependencies on terrestrial ecosystem and water use, and high impacts on greenhouse gas (GHG) emissions as well as other pollutants and solid waste.

Score	Rating
>= 3.5	High
>= 2.5	Moderate
< 2.5	Low

GICS Subindustry	Terrestrial ecosystem use	Freshwater ecosystem use	Marine ecosystem use	Water use	GHG emissions	Non-GHG air pollutants	Water pollutants	Soil pollutants	Solid waste	Disturbances	AUM (% of FSI total)
1 Diversified Metals & Mining	High	High	Moderate	High	High	Moderate	Moderate	Moderate	Moderate	Moderate	2.3%
2 Packaged Foods & Meats	High	Moderate	Moderate	High	High	Moderate	Moderate	Moderate	High	Low	2.1%
3 Biotechnology	Moderate	Moderate	Moderate	High	High	Moderate	High	Moderate	Moderate	Moderate	2.1%
4 Industrial Machinery	Moderate	Moderate	Moderate	High	High	Moderate	High	High	High	Moderate	1.4%
5 Semiconductors	Low	Low	Low	Moderate	High	Moderate	High	High	Moderate	Moderate	1.4%
6 Personal Products	High	Moderate	Moderate	High	High	Moderate	Moderate	Moderate	High	Low	1.3%
7 Household Appliances	Moderate	Moderate	Moderate	High	High	Moderate	High	High	High	Moderate	1.0%
8 Automobile Manufacturers	Moderate	Moderate	Moderate	High	High	Moderate	High	High	High	Moderate	1.0%
9 Highways & Railtracks	High	High	Moderate	High	High	High	Moderate	Moderate	High	High	1.0%
10 Technology Hardware Storage & Peripherals	Low	Low	Low	Moderate	High	Moderate	High	High	Moderate	Moderate	1.0%
11 Food Retail	High	Moderate	Moderate	High	High	Moderate	High	Moderate	Moderate	Low	0.9%
12 Oil & Gas Exploration & Production	High	High	Moderate	High	High	High	High	High	Moderate	High	0.7%
13 Airport Services	Moderate	Moderate	Moderate	Moderate	High	High	High	High	High	High	0.6%
14 Apparel Accessories & Luxury Goods	High	Moderate	Moderate	High	High	High	Moderate	Moderate	Moderate	Moderate	0.6%
15 Auto Parts & Equipment	Moderate	Moderate	Moderate	High	High	Moderate	High	High	High	Moderate	0.5%

Heatmap exercise on FSI's listed equity holdings (AUM based on December 2022)

As TNFD noted in its guidance: greater specificity about supply chains, biomes or geographies could improve the accuracy and usefulness of a heatmap.

24 These percentages are not supposed to add up to 100% as one sector can have multiple pressure areas such as climate change and water use at the same time.

25 The result shown does not include pressure categories without data (other resource use and biological alterations/interferences) and sectors without data in the other categories that are shown.



**A combined use of these metrics enables investors to identify target companies for further assessment, to have preliminary knowledge on how the company views and measures its risk, opportunities, dependencies and impacts on nature**

## Step 2: Company Prioritisation and Assessments

**Before jumping into detailed company-level assessment, investors can try narrowing down the number of target companies by prioritisation, based on country-level, sector-level data (Step 1) and utilising available nature-related databases.**

### 2.a) Company Prioritisation

- On freshwater, our approach suggests looking for metrics such as water use, water intensity, water risk management, discharges and releases, water rights, water intensity trends and water withdrawal. Country-level and sector-level water risk and intensity data can be useful (e.g. WWF Water Risk Filter or CDP Water).
- On forests, investors can assess metrics such as land and biodiversity use, sustainable agriculture programmes, presence of deforestation and biodiversity programme, strength of zero deforestation commitments and concrete

mechanisms for implementation provided by ESG data providers and/or from NGOs and civil society organisations (e.g. Forest 500<sup>26</sup>, ZSL SPOTT<sup>27</sup>, Nature Benchmark Score<sup>28</sup>, CDP etc.). Whilst these datasets may not provide full investment universe coverage, they typically select for most exposed/most significant companies to nature-related risks, so can still generate useful, risk-based assessments and insights. Also, they disclose their methodologies transparently.

For both areas, checking related controversies is another useful step to understand the current and past practices.

A combined use of these metrics enables investors to identify target companies for further assessment, to have preliminary knowledge on how the company views and measures its risk, opportunities, dependencies and impacts on nature, and to prepare for material issues or gaps to discuss with the companies. In the Spotlight section below, we discuss FSI's approach to navigating data.

<sup>26</sup> Global Canopy, 2023: [Forest 500](#), developed by Global Canopy, annually tracks deforestation-related policies and performance of the 350 most influential companies and 150 financial institutions, focusing on company response, policy and management of deforestation issues.

<sup>27</sup> Zoological Society of London, 2023: [SPOTT](#), assesses commodity producers, processors and traders of palm oil, natural rubber, timber and pulp on their public disclosure of ESG aspects.

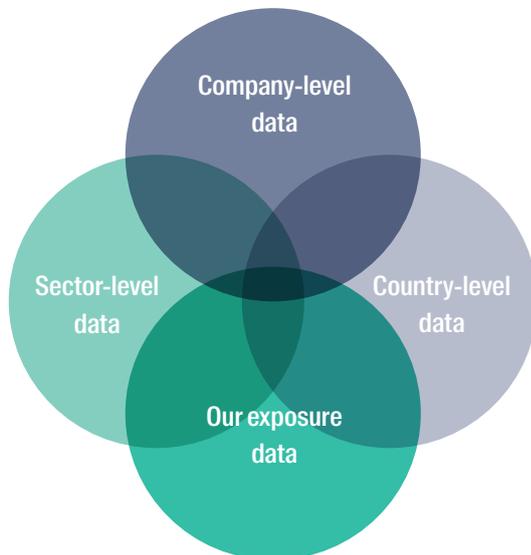
<sup>28</sup> World Benchmarking Alliance, 2023: [Nature Benchmark](#), developed by, currently covers 400 companies in the world assessing transformation indicators across E, S and G aspects of company practices and their efforts to protect environment and its biodiversity.

## SPOTLIGHT: FSI'S APPROACH TO NAVIGATING THE PATCHY NATURE DATA SPACE

Financial institutions tend to focus their nature data on lending, and investee and insured exposures, often using external data providers, which use proxy data and estimation<sup>29</sup>. The industry expects that more data will be disclosed by companies over time as the TNFD framework and related standards are applied. Currently, however, it is often said that nature data is patchy, limited, inaccurate, not standardised, and sometimes hard to understand. While most ESG data (not just nature and biodiversity) tends to be behind a paywall, **some nature data is still available and accessible to any. In order to find quality data, one needs to know where and what to seek.**

As part of the sector-level and company-level assessment, we brought together different data points from multiple sources (both paid and free) and mapped them across our listed investment holdings.

### Our layered approach to nature data



Nature data and sources for all of our listed equity and fixed income asset classes

- Material sectors on water issues (CDP Water Impact Index)
- Material sectors on deforestation (Global Canopy Finance Sector Roadmap)
- Country-based water risk (WWF Water Risk Filter)

- Country-based deforestation risk (Global Canopy Finance Sector Roadmap)
- Country-based modern slavery risk (WalkFree Global Slavery Index)
- Company-level TNFD Forum member status (TNFD)
- Company-level Forest 500 score (Global Canopy)
- Company-level Nature Benchmark score (World Benchmarking Alliance)
- Company-level Sustainalytics' nature indicators including biodiversity and land use, water consumption, effluents, etc.
- Biodiversity, water and waste related data from SFDR Principle Adverse Impact indicator mapping (Sustainalytics)
- Company-level controversy data (RepRisk)
- HQ location of our equity and fixed income holding companies/issuers (per our own holdings data)
- Assets under management (AUM)

Data still seemed patchy - even after the mapping, we still found some companies without any kind of information. In terms of mapping deforestation risk, the biggest challenge is limited data demonstrating the linkage between companies and key commodities they depend on, either as an input or as output of the business. In this process, we learned that some commodity-related data is available either at country- or sector-level, but more granular data on company-level is not available or still in the development phase (see below).

Also, using company HQ locations to represent the country risk has limitations, as companies often operate outside the HQ country and suppliers are much more widely distributed. Nevertheless, many companies do tend to have operations within the HQ country so using this data in the absence of more accurate location-data is a good starting point. We hope to see more developments in both of these areas.

<sup>29</sup> TNFD, March 2023: [TNFD v0.4 Annex 4.4 Additional Disclosure Guidance for Financial Institutions](#)

## Commodity-related available data

- High forest risk countries, and key agriculture commodities they produce or trade (e.g. Indonesia and palm oil, can be found in the Finance Sector Roadmap and Trase Finance)
- High forest risk sectors, and key agriculture commodities they are exposed to (e.g. forest products and pulp, can be found in the Finance Sector Roadmap)
- Key agricultural commodities and pressures each commodity adds to nature loss (SBTN's High Impact Commodity List<sup>30</sup>)
- Water, deforestation and biodiversity-related information on 60 of the largest listed global meat, dairy and aquaculture companies (Coller FAIRR Protein Producer Index<sup>31</sup>)
- High modern slavery risk countries, and key commodities they produce or trade (e.g. India and cotton, can be found in the Global Slavery Index<sup>32</sup>) or company- and sector-level modern slavery scorecards (e.g. data provided by ISS)
- Key commodities and other products produced by child labor or forced labor for some selected sectors (List of Goods Produced by Child Labor or Forced Labor provided by the U.S. Department of Labor<sup>33</sup>)

## Data in development or not widely known

- Key soft commodities each industry depends on for all sectors (general reference data; this is being estimated based on trade data by some tool developers)
- Company name and key commodities they rely on in terms of revenue (e.g. a leather company and leather)
- Linking producers and processors of forest risk commodities to companies using these commodities downstream in production processes (in development by Bloomberg)
- Counting company / company supplier assets in areas of high ecosystem intactness, or in areas where ecosystem intactness is decreasing rapidly (in development by Bloomberg)

In the absence of supply chain data, some companies or biodiversity impact measuring service providers use input output databases generated on country-level or sector-level. They use input output databases and other trade data to map the complex supply lines connecting key commodities or products, and attempt to identify which companies are buying or selling in which specific countries. This is another area expected to advance fast in the near future, aided by data science and technologies.

By using these data points to filter, we were able to come up with a priority list of companies with a good understanding of the gap areas that can be discussed during engagement. We will continue to advance the data by adding more data points (depending on the availability, accessibility and quality of data).



30 SBTN, May 2023: [SBTN High Impact Commodity List](#)

31 FAIRR, 2022: [Coller FAIRR Protein Producer Index](#)

32 Walk Free, 2023: [Global Slavery Index Data](#)

33 Bureau of International Labor Affairs, September 2022: [List of Goods Produced by Child Labor or Forced Labor](#)

Once a list of target companies has been developed, the next step is assessing these companies more deeply using corporate reports, website disclosure and other existing resources such as industry white papers. **During this stage, two important things to keep in mind for due diligence are ‘location’ and ‘supply chain’.** Many corporate sustainability reports focus on a company’s own management of natural resources or environmental protection efforts without linking it to nature-related risks that are location-specific. Simply looking at natural resources that are used as input for direct operations (e.g. tofu in a food manufacturing company located in Japan) would result in limited insights for risk management (although it is still a good start) and for the goal of preventing nature loss, because those upstream (e.g. soybean farming in Paraguay that is used to make tofu) depend a lot more on nature and generate more impacts. This is why we must understand the supply chain, including downstream if data is available, to conduct a robust company-level assessment.

## 2.b) Water Assessment Guidance

The below water assessment guidance is built on four dimensions: water risk exposure in both direct operations and in the supply chain, as well as water risk management in both direct operations and supply chain. It is worth noting that **water risk differs from water intensity** – whilst water intensity refers to the rate at which water is used in a given area<sup>34</sup>, water risk refers to physical risks, as well as regulatory and reputational risk when the data is available. Physical water risk could be company operation-specific or basin-specific (basin risk<sup>35</sup>). **We need to examine how a company sources water, where the water is sourced from and used (locations), and how it manages and uses water (purpose and its role in the business).** This matrix is useful to identify companies that have higher exposure to water risk and poorer management of that risk, and to refine investors’ approach based on whether that risk is in their investee companies’ direct operations or supply chain.

Engagement focus/scope	Description	Direct Operations	Supply Chain
Water risk exposure	Includes physical, regulatory, and reputational risk. Complement with forward-looking data linked to climate change, where available	Focus on water scarcity, quality, flooding or drought risks in direct operation locations (especially in the same river basin)	Locations and sourcing of revenue-related soft commodities and how they are exposed to water risk
Water risk management	Includes water use and intensity	Focus on company’s management of water and long-term strategy	Revenue-related soft commodity’s water intensity and management

Water risk metrics may include:

- % of facilities in the portfolio located in areas with water stress
- % of portfolio companies (by number and by portfolio exposure) exposed to substantive water risk
- Total amount of untreated water in megalitres discharged to the natural environment by portfolio companies (water quality issue)

Water intensity metrics may include:

- Weighted average water withdrawal intensity, expressed in megalitres of water withdrawn/\$M revenue (The indicator should be broken down by sector and asset class)
- Portfolio water withdrawal from water-stressed areas, expressed in megalitres of water withdrawn from areas with water stress/\$M invested

34 In company reporting, ‘water use’ could mean two different metrics: water withdrawal, referring to the taking of water from ground/surface water source, or water consumption, which refers to a portion of the withdrawn water, permanently used up.

35 Basin risk is the risk of negatively impacting water ecosystem services in river basins due to droughts, floods or pollution.

**General principles:**

- If the target company operates in a high water risk country or area (e.g. a textile company with direct operations located in Pakistan), assess whether the company is disclosing its water use and water intensity data (ideally year after year for consistency). Check whether the company is using a form of internal pricing for water<sup>36</sup>, which is the monetary value of water assigned by a business. This may include the cost of treating, transporting and discharging water or it could consider the benefits of both saving water and avoiding water pollution.
- If most of the water risk seems to be originating from the company's supply chain, check if the company is aware of supplier water management and the dependence of their water source in certain river basins.
- It is important to account for water dynamics in time and space, as well as supply chains and local contexts. Given the trickle down impacts from a basin's upstream to downstream, this aspect of cascading risks is critical. For example, the textile industry's use of water and discharge of wastewater in the upstream can affect the water quality of major rivers' downstream sections, where many industry suppliers and manufacturing facilities tend to be clustered. It is advised to assess water risk on a landscape-level such as a river basin.
- If a company has low exposure to physical water risk (for example if it sources its water - for direct operations and/or throughout its supply chain - from areas with adequate water quality and abundance in water quantity), then metrics such as water use and intensity data are not as useful as they are for companies sourcing water from water-deprived areas.
- If a company depends on the quality of water or its manufacturing process has high effluents or wastewater, the key metric is weight of Nitrogen (N), or weight of Phosphorus (P) per time unit (such as kg P/month) from all its facilities/sourcing locations within a specified basin level and time period. It is worth checking whether the company has proper runoff/ wastewater management systems in place.

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**It is important to account for water dynamics in time and space, as well as supply chains and local contexts. Given the trickle down impacts from a basin's upstream to downstream, this aspect of cascading risks is critical**

## Assessing a company's exposure to and management of water risks:



- 1) Assess the company's reporting on water-related risks, opportunities, impacts or dependencies.
- 2) Assess how water is used in the company, how the company talks about water in general (e.g. in the context of climate change risk, response, resilience or in terms of cost savings) and which water risk is the most material based on the company's location and business.
- 3) For companies in the infrastructure, real estate and hotel industry, it is important to understand physical risk related to the identified locations (flood risk, drought risk and pollution risk) by using tools like Water Risk Filter<sup>37</sup> or Aqeduct<sup>38</sup> and to identify areas with increasing water risk in the future.
- 4) For companies in food and beverage, consumer goods, apparel and textiles, and pulp and paper:
  - Define the three most relevant commodities per company (i.e. commodities that contribute the most to a company's revenue). If this metric is not available, identify the commodity that contributes the most to a company's products by weight (kg of total kg purchased)<sup>39</sup>.
  - Assess the water intensiveness of the commodities per sourcing location (in general, water intensive agricultural commodities include meat, nuts, rice, soybeans, wheat, sugarcane, avocado and cotton)
  - Investigate if the company is disclosing any location information (country-level and basin-level) for its direct operations and upstream supply chain (assuming downstream location information is much harder to obtain).
  - Check supply chain data provided by the company or a third party, or from a sector-level data provider (e.g. Open Supply Hub<sup>40</sup> or GeoAsset Databases<sup>41</sup>) – e.g. supplier names, countries, sourcing locations, etc.
- 5) Identify any missing information or gaps to follow up with the company directly.

### Company examples<sup>42</sup> of managing water-related risks<sup>43</sup>

- H&M: the company's work on water initially focused on reducing water consumption and pollution in its supply chain. It conducted a water risk assessment for both its direct operations and suppliers. Following this, H&M adopted water stewardship firm-wide and began working with other stakeholders and brands around the basins where they operate. It is currently focusing on becoming more water efficient and improving water in some of the world's most stressed water basins; its vision is to have a positive impact on water by 2030. The company website discloses strong supply chain information, including a full list of suppliers and their locations<sup>44</sup>.
- Nestlé: the company formed a large consortium working to analyse water risks at a basin level, leading to the creation of regenerative agriculture plans at an individual farm level; 100+ projects will be implemented around its 48 global waters sites by 2025<sup>45</sup> (linking regenerative farming techniques to water quality and quantity management); and it has developed a strong incentive system for local farmers.

37 WWF Germany, 2023: [Water Risk Filter](#) (is best used when location data is available); WWF Germany, 2023: [Biodiversity Risk Filter](#) (new filter from WWF).

38 World Resources Institute, 2023: [Aqeduct](#)

39 [South Pole, 2020: The Methodology for Water Risk Assessments of Equity Portfolios](#)

40 Open Supply Hub, 2022: [Open Supply Hub](#) Open Supply Hub is an expansion of the Open Apparel Registry (OAR), which mapped over 90,000 facilities in the apparel sector. Also covers consumer goods, furniture, sporting goods, beauty and electronics sector.

41 Spatial Finance Initiative, January 2023: [Global Database of Cement Production Assets and Iron and Steel Production Assets](#)

42 Reference to the names of each company mentioned in this material is merely for explaining or illustrating the company's approach or work and should not be construed as investment advice or investment recommendation.

43 More cases can be found here (SBTN, 2022)

44 H&M Group, 2023: [Supply Chain](#)

45 Nestlé, 2022: [Creating Shared Value and Sustainability Report 2021](#)

## 2.c) Deforestation Assessment Guidance

Assessing companies' approach to deforestation starts from understanding how they view this complex issue in the context of their business. If investors have already found a company material for deforestation, it is likely that the company also recognises the issue and is disclosing some information or viewpoints about it, even if it does not directly mention its action or commitment to stop deforestation within a certain timeframe. If however, there is no information provided by the company or by ESG data providers, investors' first step might be checking for any related controversies or news coverage related to its land use or sourcing/financing practices. We discuss how to advance from this point in the Company Engagement section in Step 3.

### General principles:

- **The ultimate goal of company assessment and engagement should be to eliminate commodity-driven deforestation, conversion<sup>46</sup>, and associated human rights abuses from investment portfolios.** But to be able to monitor the progress, companies must know their supply chain and location-based impacts of their business activities contributing to deforestation (hence the importance of disclosing such information to investors).
- This includes both legal and illegal deforestation and conversion of land. Requiring and supporting companies to be free from all forms of deforestation can actually make the implementation of their commitments easier, as it is harder to establish if deforestation is

taking place and then go on to define whether it is legally compliant or not. Also this is a common reason some companies use to justify their sourcing. In some countries where legal standard is very low, practices may be legal but still contribute to deforestation.

- Relatively easy to find info via checking for certifications and alignment with certain sustainable commodity standards (see Appendix for the list) and find any commitments made on deforestation.
- In order to prevent deforestation leakage<sup>47</sup>, companies' deforestation policies should apply to all production sites and all tiers of their suppliers, and should commit to full traceability to the level where they can ascertain deforestation-free production.
- For banks – key assessment point would be whether a bank has a policy on deforestation and whether it tracks and monitors its clients/companies that are associated with deforestation. Another useful indicator is the presence of an escalation and remediation process, in case its clients fail to address specific concerns around deforestation.

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**To be able to monitor the progress, companies must know their supply chain and location-based impacts of their business activities contributing to deforestation**

<sup>46</sup> Refers to clearing of natural forests and other natural ecosystems such as critical wetlands, savannahs and high conservation value ecosystems to use the land for another purpose.

<sup>47</sup> Deforestation leakage can occur within a company when not all production sites are covered by zero-deforestation commitments, and also within supply chains when companies that are not implementing their zero-deforestation commitments overtake the market share of those that are making progress.

## Assessing a company's exposure to and management of deforestation risk:



- 1) Assess what the company is reporting on in relation to deforestation risk, forest conversion, any related human rights risks (such as modern slavery risk), and steps taken to manage exposures to these risks in order to get a sense of actual risk. It is also beneficial to check for any commitments or policies on deforestation (refer to the Step 3.b Deforestation Engagement Framework)
- 2) Assess the company's exposure to deforestation or high forest risk soft commodities (TRASE Finance for the finance<sup>48</sup> sector and others based on company reporting, as well as any ESG databases); and how the company trades with/through/in high forest risk countries<sup>49</sup>
- 3) Identify any third-party certification schemes or industry standards<sup>50</sup> related to sustainable forestry management or commodity sourcing/procurement. This could be done on a product-level, site-level or entity-level, depending on the type of certification. Make sure the certifications are recognised and used industry-wide and check whether they certify based on robust criteria and process. A good source to explore more sustainability standards is Standards Map<sup>51</sup> developed by International Trade Centre.
- 4) If asset-level location data is available per investee company, then assess physical locations of deforestation using real-time spatial data such as Global Forest Watch<sup>52</sup> or WWF Deforestation Fronts<sup>53</sup>. Check for activities or operations in or near biodiversity sensitive areas, protected areas or World Heritage Sites (as these areas may be in or near high conservation value forests or tropical forest areas). Integrated Biodiversity Assessment Tool (IBAT) can be used as a quick desk-based solution to identify whether investee operations may impact areas of high biodiversity value.
- 5) Investigate if the company is disclosing any location information related to its upstream supply chain (assuming downstream location information is much harder to obtain) and sourcing of soft commodities; note relative business importance of a site to the overall company (e.g., a site with 5,000 units of output per year might be more important than a site with only 1,000 units of output)
- 6) Identify any missing information or gaps to follow up with the company directly.

### Company examples<sup>54</sup> of addressing deforestation

- Musim Mas (Integrated palm oil producer): the company provides full disclosure on suppliers and their locations<sup>55</sup> (high traceability); made a no deforestation, no peat and no exploitation (NDPE) commitment in 2014 and has a strong policy for supplies (in different tiers); has obtained various certifications and verifications; follows the Free and Fair Labor in Palm Oil Production Principles<sup>56</sup>; and has strong engagement with stakeholders including small farmers, governments and the industry.
- Tesco: the company provides sourcing information and progress reporting on soy, beef and palm oil, has a deforestation policy, has cut contracts with non-compliant suppliers and prioritized sourcing from low-risk suppliers, mapped its suppliers for soy and palm oil (both in the UK and globally), has a goal to have imported soy deforestation and conversion-free by 2025 at the latest<sup>57</sup>, and is requiring its suppliers to show how they will comply with Tesco's supplier requirements.

48 Global Canopy, Neural Alpha and Stockholm Environment Institute: [Trase Finance](#) builds on Trase's supply chain mapping capabilities, linking the trade of agriculture-driven soft commodities that drive deforestation (in certain countries) to financial markets worldwide.

49 Deforestation Free Finance, 2021: [Global Canopy Finance Sector provides](#) list of high forest risk countries

50 See Appendix for a list of standards and certifications.

51 International Trade Centre, 2023: [Standards Map](#)

52 World Resources Institute Land & Carbon Lab: [Global Forest Watch](#)

53 WWF, 2020: [Deforestation Fronts](#)

54 Reference to the names of each company mentioned in this material is merely for explaining or illustrating the company's approach or work and should not be construed as investment advice or investment recommendation.

55 [Musim Mas, 2023: Traceability](#)

56 Humanity United, 2015: [Free and Fair Labor in Palm Oil Production: Principles and Implementation Guidance](#). This is based on the International Labor Organization core conventions and the UN Guiding Principles on Business and Human Rights, and it builds on the existing standard established by the Roundtable on Sustainable Palm Oil (RSPO).

57 Tesco, 2023: [Protecting forests](#)

### Step 3: Company Engagement

Investors will have unique priority topics and areas based on their strategies, asset classes and material exposure to certain geographic areas or sectors which will also influence how engagement objectives are mapped out.

For FSI, the engagement objectives we outlined for water and deforestation issues include:

- To encourage companies to improve their understanding in nature-related risks, opportunities, impacts and dependencies
- To encourage companies to set clear policies and/or commitments on the nature-related issues material to their business, in particular those related to water or deforestation
- To encourage more disclosure on supply chain and location data of their operations and acknowledgment of the importance of such data in understanding nature-related issues
- To urge companies to stop deforestation by 2025<sup>58</sup>
- To ensure companies do not negatively impact water availability in water-scarce areas and water quality across their value chain<sup>59</sup>

Building on the results from Step 1 and Step 2 in this guide, the engagement framework and questions can be used to support investors' engagement with priority list companies. **It is important for investors to understand the materiality of the issues and develop clear objectives for the engagement phase, with an aim to support companies in identifying areas for improvement and setting time-bound implementation plans on those areas.**

Because this nature space is still in early development phase, focusing on corporate disclosure and transparency more broadly could be the first step (especially when location data of investee companies' operation is hard to find), and once more companies become aware of their dependencies and impacts and location data becomes more available, investors can develop more

outcome-driven asks in actual locations of operation and supply chain.

#### 3.a) Water Engagement

Depending on the company's water risk, sector-level risk, locations and management response level, the following questions may be relevant:

##### Policy and process

- Do you have a publicly available water policy?
- Do you have a time bound target on water (water use, intensity, waste discharge, etc.)?
- What proportion of your capital expenditure budget are you allocating towards water management, in what areas is it being spent, and what examples can you provide for water related capital expenditure, either planned or completed?

##### Water use and discharge practice

[If the company uses water as a direct source for the business]

- Do you measure and compare water consumption per unit of production of different production facilities that you operate? If so, how do the ones located in water deprived areas compare?
- Do you benchmark your own average and best in class facilities for water consumption against competitors, i.e. water use per unit of production? If so, how do you compare?
- Do you understand where your water is sourced from and what type of water risk the river basin is facing (in relation to climate change)?
- Do you measure and monitor water withdrawals and/or consumption volumes? For which % of your facilities do you conduct such assessments? What proportion of water withdrawn in water stressed areas is treated and reused, if any?
- Do you monitor and measure water discharge volumes? For which % of your facilities do you conduct such assessment? And what pollutants and emissions<sup>60</sup> (to water bodies) do you disclose?

58 UNFCCC, November 2021: [Financial Sector Commitment Letter on Eliminating Commodity-Driven Deforestation](#)

59 Ceres, 2018: [Corporate Expectations for Valuing Water](#)

60 This answer can contribute to reporting one of the Principal Adverse Indicators under the SFDR.

If the company relies on commodities that highly depend on water or has supply chain system that is highly vulnerable to water risk, you could also ask:

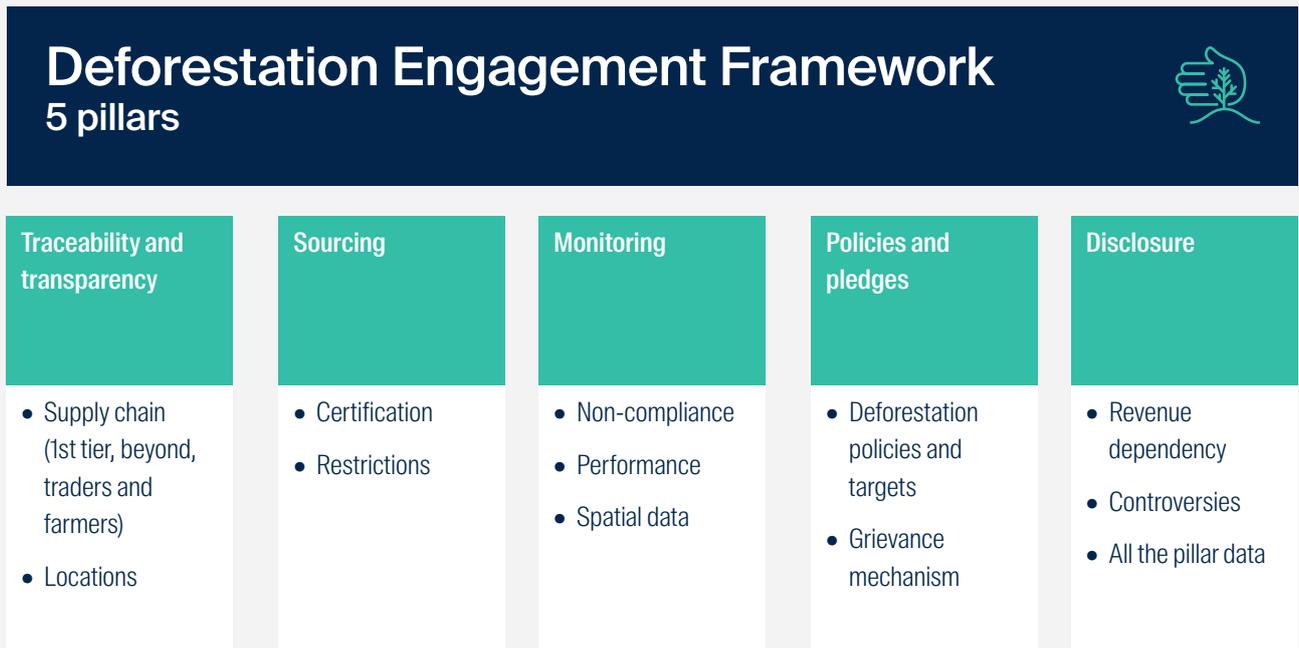
- Do you understand the commodities' water risk in the context of the sourcing locations and how it can affect your business?
- Are you aware of the locations where key commodities source water from? From your engagement with suppliers, have you found any water risk information that could be material to the commodities?

### 3.b) Deforestation Engagement Framework

Company engagement should be built on the assessment work explored in Step 1 and 2. When there is a lack of disclosure on deforestation issues,

investors can strive to make this issue better acknowledged and understood by the company, so that the company starts examining this issue especially in relation to their sourcing locations. During this process, investors can try to raise awareness in the existing resources and databases that companies can utilise, as a way of providing solutions to improve disclosure.

In terms of understanding the materiality of issues related to deforestation, our Deforestation Engagement Framework provides five pillars to check: **traceability and transparency, sourcing, monitoring, policies and pledges and disclosure.** With some companies there will be more than one pillar to discuss, but with some others, investors may need to target traceability and transparency, and/or certification first.



Pillars	Sample questions
Traceability & Transparency	<ul style="list-style-type: none"> <li>• How much of your annual revenue is dependent on forest risk soft commodities? (this can be based on percentage, or absolute)</li> <li>• Are you producing, processing, or procuring (including indirectly) soft commodities from or in high-risk regions and countries (such as Brazil, Colombia, Indonesia, Malaysia, Democratic Republic of the Congo etc.)?</li> <li>• Which suppliers are you sourcing the commodities from, including both direct and indirect suppliers?</li> <li>• Do you keep a record of where your operations, assets, or projects are located (including financed assets)?</li> <li>• What proportion of volumes of commodities produced, procured, or financed are of an unknown origin?</li> <li>• What proportion of forest-risk commodity sourcing is traceable to geographies (e.g. jurisdictions or nations) where the level of risk for deforestation, conversion, and associated human rights abuses is known?</li> </ul>
Sourcing	<ul style="list-style-type: none"> <li>• What proportion of volumes of each forest-risk commodity produced, sourced, or <u>financed</u> by your company are assessed and/or verified as deforestation- and conversion-free?</li> <li>• What proportion of volumes of each forest-risk commodity produced, sourced, or <u>financed</u> by your company are certified by third parties?</li> <li>• Does your company restrict sourcing to certain geographic regions/countries based on deforestation risk?</li> <li>• Are there any additional scrutiny measures for commodities originating from certain areas with high-deforestation risk?</li> </ul>
Monitoring	<ul style="list-style-type: none"> <li>• Do you have effective compliance monitoring systems in place for your supply chains/<u>financing activities</u> for deforestation, conversion and associated human rights?</li> <li>• Do you know how many hectares of deforestation and of conversion have occurred in your operations, supply chains, or <u>financed projects</u> within the past year and in the last five years?</li> <li>• How many grievances have been raised against your company related to deforestation, conversion, and human rights abuses and what is the status or resolution of these grievances?</li> <li>• Do you use remote sensing-based technologies (e.g. satellite, no-human aircraft/drones, Lidar, etc.) to monitor your progress and verify supplier compliance?</li> </ul>
Policies and pledges	<ul style="list-style-type: none"> <li>• What systems do you have in place to address risks of deforestation, conversion, and associated human rights risk (e.g. policies, traceability systems, supplier monitoring)?</li> <li>• Do you have deforestation, conversion and human rights commitments /policies in place for all high forest-risk commodities that are material to your business?</li> <li>• Does your zero-deforestation policy or commitment ensure that it applies to all sourcing and production sites, as well as all tiers of suppliers to prevent leakage (i.e. no deforestation in one area at the expense of another)?</li> <li>• Do you have a policy to respond to non-compliant suppliers and clear resolution processes (including exclusion)?</li> <li>• Is your company a member of any deforestation-related industry alliances or initiatives?</li> <li>• Do you have a policy or plan to <u>invest, finance</u> or participate in ecosystem conservation projects, nature-based solutions, sustainable agriculture projects, restoration projects or projects that support Indigenous peoples and local communities?</li> </ul>
Disclosure	<ul style="list-style-type: none"> <li>• These are expectations rather than questions (noting that investors are likely to have a good understanding of what disclosure is available prior to engaging with a company)</li> <li>• Proportion of your annual revenue that is dependent on forest risk soft commodities or that is linked to deforestation.</li> <li>• Percentage of commodity volume that is traceable, per each commodity type.</li> <li>• Assessment of material high-risk soft commodities and their sourcing locations.</li> <li>• Deforestation-related policies, targets or commitments.</li> <li>• Grievances raised against your company, controversies or non-compliant cases publicly and how you dealt with those issues and plan to resolve them.</li> <li>• Regular disclosure on progress and performance in relation to your policies, targets or commitments made.</li> <li>• Plans to improve transparency around deforestation-related disclosure.</li> </ul>

Engagement asks can be based on the results of the assessment and responses received from the companies. It is good to be specific when framing asks, but there may be loopholes if they are too specific. Framing the asks as 'no deforestation in the Tropical Rainforest Heritage of Sumatra site in Indonesia' is targeted and could be an appropriate scope for certain companies, but for others with a wider footprint, framing the ask such as 'no procuring or processing of palm oil that is sourced from producers associated with tropical deforestation in Indonesia' could be a more suitable approach.

#### Step 4: Record-keeping and reporting

It is highly beneficial for us as investors to record-keep and report on progress from our engagements. Such information can be useful to understand the approach, to take stock of engagement history and outcomes, and to disclose the work to external stakeholders for reporting purposes. Reporting outcomes of company engagement on nature could feature, for example, the number of companies engaged on the topic of nature and biodiversity, company prioritisation and assessment process, formulation of key asks, and company response and follow up. An important note is to keep tracking

performance and monitor commitments and actions made by companies.

#### Step 5: Escalation

The escalation process is aligned with the principles and general guidelines from our own [Responsible Investment policy](#) and draws from similar investor toolkits. Where an investor identifies a nature and/or biodiversity incident within the operations or supply chain of an investee company, they should first conduct investigation and assessment of risks, followed by internal communication and tracking responses. If adequate responses are not received, or if the issue requires urgent attention or has severe impact, investors can escalate the issue using their own escalation policy (such as writing to the company), including the consideration of divestment. Publications such as the Finance for Biodiversity Guide on engagement with companies<sup>61</sup> and the Deforestation-Free Finance Due Diligence Guidance<sup>62</sup> outline such mechanisms to escalate through the engagement and stewardship process, including dialogue with management, shareholder resolutions, voting, and in some cases adding contractual provisions to link financing to compliance with implementation of nature-related commitments.



**Reporting outcomes of company engagement on nature could feature, for example, the number of companies engaged on the topic of nature and biodiversity, company prioritisation and assessment process, formulation of key asks, and company response and follow up.**

61 Finance for Biodiversity, 2022: [Guide on Engagement with Companies](#)

62 Global Canopy, 2023: [Due diligence towards Deforestation-Free Finance](#)

# 3. Way forward

## Opportunities and challenges

We believe that assessing our exposure to water and deforestation, mapping various data points to our holding companies, assessing priority companies in depth, and engaging on material issues and gaps, can provide us new opportunities to understand our risk and dependency on nature. It can also help identify areas where we, as investors, can make a positive outcome on the ground by sharing best practice with investee companies and linking solutions and innovative players to them.

The assessment and engagement framework laid out in this document can be helpful to conceptualise the work that needs to be done by providing a practical approach. However, this can only be implemented with the right data on the right level, including:

- company-level data (e.g. company use of water),
- location-based data (e.g. location of a factory that company owns),
- commodity revenue data (e.g. % revenue dependent on palm oil),
- supplier location data (e.g. location of timber suppliers and where they are sourcing raw materials from),
- downstream tracking data during and after use (e.g. plastic waste), and
- spatial data (e.g. spatial data showing company operations and key protected areas).

As mentioned earlier, certain datasets are more accessible than others, but this is a rapidly- evolving space. As more companies start to build knowledge, measure their own impacts and dependencies, and disclose more transparent asset-based information and supplier data, there will be more opportunities for investors to assess nature-related risks, dependencies, and impacts. We believe improved disclosure is an important objective for company engagement as this area continues to evolve.

The TNFD recommends that investors “disclose the locations where there are assets and/or activities in the organisation’s direct operations, and upstream and/or downstream and/or financed where relevant, that are in priority areas.” Such location-based information will enable far more realistic analysis on nature, beyond using estimation and proxy data. Further development of spatial data and its analysis techniques, biodiversity sampling (eDNA), artificial intelligence, and some combination of these will provide new opportunities for investors to access data on companies without having to solely rely on voluntary company data.



Another challenge is approaching this topic in a more holistic way. Many financial institutions are already engaging with companies on other ESG issues like climate change or human rights. **It is our view that biodiversity and nature issues, if not properly addressed, can exacerbate the existing problems, or if better handled, can provide solutions to other issues.** This is especially relevant to deforestation issues, where nature loss, climate change and human rights abuse are often intricately linked in a certain biome or location. In some cases, there can be trade-offs between these, for example mining copper in primary forests where indigenous communities are present. Copper is critical for the climate transition, as it is essential for the rapid manufacturing of electric vehicles or solar panels, yet in many cases mining such metals take place in high-conservation-value forests without proper engagement with local communities. Another example is power generation using biomass made of freshly cut timber sourced from tropical forests (both illegally and legally) instead of using wood pellets or

wood residue. Some countries report such power generation as part of their renewable energy mix, but it is not conducive to fighting climate change as it could result in deforestation. Further examination of the mining, energy and power sector’s dependencies and impacts on nature would be beneficial to build more knowledge in this nexus between climate change, nature<sup>63</sup> and human rights.

FSI believes that the use of human rights-related data and indicators such as Global Slavery Index by Walk Free in our data mapping or reference to the ‘List of Goods Produced by Child Labor or Forced Labor’ provided by the U.S. Department of Labor (see Spotlight: FSI’s approach to navigating the patchy nature data space) is a good approach to bringing these topics closer. Incorporating such indicators into company prioritisation can help investors understand the connection between soft commodity production supply chain (which can be involved in deforestation) and modern slavery issues. As investors, we have responsibility to better understand this nexus and set up a more holistic engagement framework.

Discussion topics	Challenges	Opportunities
Assessment approach to nature	<ul style="list-style-type: none"> <li>• Technicality and complexity of the topic to investors</li> <li>• Lack of practical, easy-to-follow guidance for investors to assessing and engaging on nature</li> </ul>	<ul style="list-style-type: none"> <li>• This guide can help identify priority companies, topics and areas most material to nature using the assessment methodologies</li> <li>• Targeted engagement with companies</li> </ul>
Data	<ul style="list-style-type: none"> <li>• Accessibility and availability of quality data</li> <li>• Limited company disclosure currently</li> </ul>	<ul style="list-style-type: none"> <li>• Improved company disclosure on location and supply chain</li> <li>• New technologies</li> </ul>
Holistic approach	<ul style="list-style-type: none"> <li>• Siloed approach to climate, nature and human rights</li> <li>• Limited understanding about the nexus</li> <li>• Trade-offs</li> </ul>	<ul style="list-style-type: none"> <li>• Reference to modern slavery or other human rights data in nature assessment (especially on deforestation)</li> <li>• Raising awareness in climate, nature and human rights nexus</li> </ul>

63 Nature Finance, May 2021: [The Climate-Nature Nexus Implications for the Financial Sector](#) (provides a useful basis for this discussion)

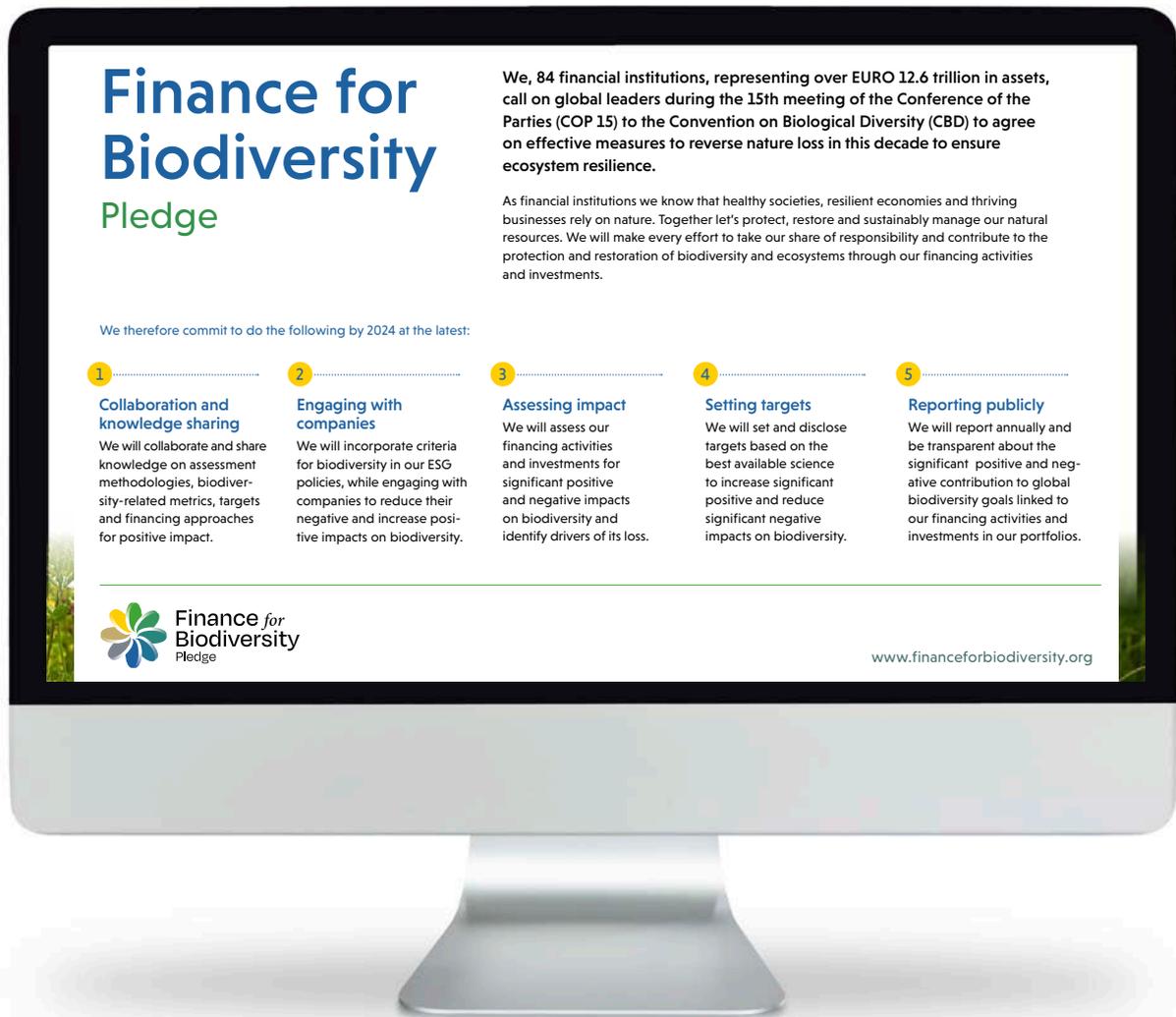
## Next steps for FSI

### Finance for Biodiversity Pledge

Since signing the Finance for Biodiversity Pledge<sup>64</sup> in 2021, FSI has been working towards delivering five actions by the end of 2024 (see image below). We reported on our progress for each action item in the 2022 RI Report. The most challenging part of the framework we currently face is Step 3, assessing impacts, and Step 4, setting targets. Regarding impact assessment, we are speaking with various providers of biodiversity footprinting methodologies, to understand their approaches and decide on a way

forward for FSI. A starting point of assessing impacts includes reporting fund-level nature-related disclosure criteria, such as ‘biodiversity sensitive area’ and ‘emissions to water’ indicator as part of the Principal Adverse Impacts disclosure under the EU Sustainable Finance Disclosure Regulation (SFDR). On target setting, we will continue monitoring the development of the Science-Based Targets Network’s work on providing guidance for financial institutions’ target setting approaches. Target setting will be largely based on the progress made in impact assessment, as it would help us understand the baseline.

### Finance for Biodiversity Pledge



64 Finance for Biodiversity Foundation, 2023: [Finance for Biodiversity Foundation](https://www.financeforbiodiversity.org/)

**We want to continue engaging with washing machine manufacturers and policy makers on microfiber pollution issue, to reduce negative impacts on nature (ocean) and further focus on the topic of pollution.**

### Other plans in the pipeline for FSI

Our work on the Nature and Biodiversity Toolkit provides a starting point, however we are looking to address a range of other issues until 2024 and beyond. Financial institutions can refer to the following as an example and build upon them in their own way:

- Development of company-level best practice examples of addressing biodiversity – in collaboration with FSI MUFG Sustainable Investment Institute we will be conducting a research project to understand status quo of company reporting on nature, targeting a few companies in the 8 priority sectors identified by the TNFD. We hope to get a better understanding of good disclosure practices and data gaps to fill. This will form the basis for further research.
- Implementing the TNFD LEAP (Locate, Evaluate, Assess and Prepare) approach – building on our work on sector materiality, priority company identification and nature-data mapping, we have started a scoping exercise disclosing type of business, entry points, and type of analysis. Through our work developing the heatmaps (as discussed in Step 1 in Chapter 2) and using the Sector Materiality Tool, we have gained an understanding in our sector-level impacts and dependencies. We will supplement this with the measurement of biodiversity footprints. We will continue to learn from peers and other TNFD Forum members to update and improve our approach over time.
- Building on our assessments so far, we are aiming to update our position on deforestation, this time targeting companies that are involved in producing, processing, trading or procuring high forest-risk agricultural commodities that contribute to deforestation in our investment portfolios.
- Collaborative engagement on deforestation with a number of companies that are material to our portfolios – targeting our investment in the food and beverage sector, we will coordinate our priorities and approaches to deforestation internally to formulate key asks for these companies to engage.
- Development of the Natural Capital and Biodiversity toolkit 2.0 which will focus on other drivers – building our experience in using the first version of the toolkit, we will develop another toolkit focusing on mining, infrastructure (including energy and power sector) and property investments.
- Engagement on plastic pollution - we want to continue engaging with washing machine manufacturers<sup>65</sup> and policy makers on microfiber pollution issue, to reduce negative impacts on nature (ocean) and further focus on the topic of pollution.

65 Environmental Finance, 2023: [ESG engagement initiative of the year, EMEA: First Sentier Investors](#)

# Call to action for investors

## 1. Use this guide for nature-related financial disclosure

We wrote our internal Toolkit initially for our investment teams at FSI, to help them understand issues related to water and deforestation and for company assessment and engagement. This guide adds further discussion, sharing insights, data resources, and lessons learned with peers and other stakeholders. **We call on other investors to use this guide for their own nature-related financial disclosure, especially to apply the TNFD's LEAP framework, which provides a risk and opportunity assessment approach.** Below table maps how our guide can be used for this purpose per each pillar of the LEAP framework.



LEAP Process	Guidance included in this document	Relevant section (jump with links)
Locate	<ul style="list-style-type: none"> <li>The guide's company assessment emphasises seeking location-based information (e.g. operational facilities with high dependencies on nature that are critical for business) in ESG data, company reporting and in engagement</li> <li>When location-data are known for either direct operations or supply chains, the guide recommends specific tools that help assess nature-related risks or impacts specific to those locations</li> <li>The guide highlights linking key commodities to their sourcing locations and understanding whether supplier locations are in or close to high conservation forest areas or high water stress areas</li> <li>This guide's data mapping approach includes company HQ location and operation in or near biodiversity sensitive areas that can be mapped on a company-level; once there is more location-based data, investors can start mapping the actual operation sites and supplier locations beyond HQ countries.</li> </ul>	Step 2
Evaluate <sup>66</sup>	<ul style="list-style-type: none"> <li>While this guide itself does not provide guidance on evaluating nature-related dependencies and impacts across investment at each priority location (as this depends on getting the location data from investee companies), the sector materiality mapping tool is based on pressures to nature, which reflects business impacts and dependencies on nature.</li> <li>CDP's Water Impact Index also provides useful insights on impacts to water quantity and quality on a sector-level.</li> <li>Mapping SFDR principal adverse impact indicators such as 'biodiversity sensitive area' and 'emissions to water' indicator helps investors evaluate impacts in a more structured manner.</li> </ul>	Step 1 and Step 2
Assess	<ul style="list-style-type: none"> <li>This guide can be useful to identify the corresponding risks and opportunities related to investment through the sector-level and company-level materiality assessment.</li> <li>The heatmap exercise is a good starting point, as recommended in the TNFD's additional guidance on assessing risks.</li> <li>During engagement with companies, investors can get a better understanding in ways to mitigate nature-related risks and seek opportunities.</li> </ul>	Steps 1, 2 and 3
Prepare	<ul style="list-style-type: none"> <li>This guide will be useful for investors to develop their own strategy and priority areas for assessment, disclosure and engagement.</li> <li>Investors can use the guide to strengthen disclosure on their assessment and engagement process, building on their own strategy and governance structure to conduct the work.</li> <li>Progress made during company engagement (as per the guide's engagement framework) can be recorded and reported, including the questions asked and feedback received.</li> </ul>	Step 3

For the 'Locate' pillar, instead of jumping to focus on certain locations where nature-related problems are known to exist (e.g. Cerrado in Amazon or Krishna River basin in India), our guide and the TNFD recommends applying the LEAP approach for the entire material sectors and prioritising companies, then examining those companies with operational assets in biodiversity-sensitive areas. This way we can assess investments more comprehensively and the data would be able to help us prioritise certain companies in important biodiversity locations, instead of cherry-picking these locations.

<sup>66</sup> This guide does not yet provide a framework for quantitative assessment of impacts and dependencies, as such methodologies are developed by multiple third party providers such as CDC Biodiversitat, Iceberg Data Lab, Partnership for Biodiversity Accounting Financials (PBAF), Fair Supply/IBAT, ISS and S&P. See Appendix for more information.

## 2. Investors can assess nature now

September 2023 will be a momentous month in the history of nature-related financial disclosure, with the launch of the TNFD final recommendations (v1.0). We are happy to be contributing to the growing body of knowledge in this space as an asset management company, although many elements are still in their infancy. Because there are so many challenges and barriers in conducting assessments and collecting relevant data, investors often wonder whether it is too early to start the work or whether there will be anything readily applicable to investment decision making from this work. During the past two years, the TNFD and its knowledge partners have made tremendous progress in bringing together existing knowledge base, translating it to the language of corporates and financial institutions, and structuring it in a way that is digestible and applicable by the target users. **It's not perfect, but there is data and we have guidance and more methodologies and frameworks are emerging. We cannot let perfect be the enemy of the good.**

This guide – called “Investors Can Assess Nature Now” or ICANN guide – is intended to demonstrate that indeed many things are already possible and financial institutions can start the work now – such as sector-level assessment, company assessment, and

engagement on key topics like freshwater and forests. It not only suggests practical ways for assessment with a step-by-step approach, but also provides useful data resources along each step so investors can easily understand which tools and database to apply in their analysis.

Throughout the preparation process, we tried to ask ourselves the question of “so what?” in order to ensure our guidance can lead to something useful for investors instead of doing the analysis for analysis’ sake. The questions posed in the engagement framework can provide helpful insights for companies to better measure and disclose their nature-related risks, opportunities, dependencies and impacts, and to develop their own policy or position on nature. This is in line with FSI’s view that as an asset manager we have the opportunity to help improve nature-related data and company practices.

We hope that investors including our peers and other financial institutions can create their own unique and practical ways to assess nature and conduct due diligence, building upon what we have shared in this guide. FSI is open to collaborative opportunities and partnerships on this topic, as the nature problems we face are systemic and complex. Let’s work together, because investors can assess nature, now.

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**We hope that investors including our peers and other financial institutions can create their own unique and practical ways to assess nature and conduct due diligence, building upon what we have shared in this guide.**



# Appendix



## Helpful resources, tools and reports

- Accountability Framework, 2022: [From Commitments to Action at Scale](#)
- Bureau of International Labor Affairs, September 2022: [List of Goods Produced by Child Labor or Forced Labor](#)
- Environmental Finance, 2023: [ESG engagement initiative of the year, EMEA: First Sentier Investors](#)
- FAIRR, 2022: [Coller FAIRR Protein Producer Index](#)
- Finance for Biodiversity Foundation, 2023: [Finance for Biodiversity Foundation](#)
- Finance for Biodiversity, 2022: [Guide on Engagement with Companies](#)
- Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), 2019: [Global Assessment Report on Biodiversity and Ecosystem Services](#)
- International Trade Centre, 2023: [Standards Map](#)
- National Public Radio (NPR), 2021: [Parts Of The Amazon Rainforest Are Now Releasing More Carbon Than They Absorb](#)
- Natural Capital Finance Alliance & United Nations Environmental Programme World Conservation Monitoring Centre (UNEP-WCMC), 2023: [Exploring Natural Capital Opportunities, Risks and Exposure \(Encore\)](#)
- Nature Finance, May 2021: [The Climate-Nature Nexus Implications for the Financial Sector](#)
- Open Supply Hub, 2022: [Open Supply Hub](#)
- Reprisk, February 2022: [Biodiversity Risk by Numbers](#)
- SBTN, 2022: [Case Studies](#)
- SBTN, May 2023: [High Impact Commodity List](#)
- Science Based Targets Network (SBTN), February 2022: [SBTN's Sector Materiality Tool.](#)
- Spatial Finance Initiative, January 2023: [Global Database of Cement Production Assets and Iron and Steel Production Assets](#)
- Taskforce on Nature-related Financial Disclosures (TNFD), 2023: [TNFD's Definitions of Nature](#)
- TNFD Framework Beta version, June 2022: [TNFD Beta Framework 0.2](#)
- TNFD Framework Beta version, June 2022: [TNFD Beta Framework 0.2](#)
- TNFD Framework Beta version, March 2022: [TNFD Beta Framework 0.1](#)
- TNFD Framework Beta version, March 2023: [TNFD Beta Framework 0.4](#)
- TNFD Framework Beta version, November 2022: [TNFD Beta Framework 0.3](#)
- TNFD, March 2023: [TNFD v0.4 Annex 4.4 Additional Disclosure Guidance for Financial Institutions](#)
- UN Environment and UNDP, 2021: [Reporting on Nature-related Risks, Impacts and Dependencies](#)
- University of Cambridge Institute of Sustainability Leadership, 2022: [Integrating Nature – The case for action on nature-related financial risks](#)
- Walk Free, 2023: [Global Slavery Index Data](#)
- World Benchmarking Alliance, 2023: [Nature Benchmark](#)
- World Resources Institute, 2023: [Aqueduct](#)
- World Wide Fund for Nature (WWF), 2022: [“Living Planet Report”](#)

- WWF and Climate & Company, 2023: [Tackling Biodiversity Risks – A biodiversity risk assessment guide for companies and financial institutions](#)
- WWF Germany, 2023: [Biodiversity Risk Filter](#)
- WWF, 2022: [Living Planet Index](#)
- WWF, 2023: [Biodiversity Risk Filter Methodology Documentation](#)
- Zoological Society of London, 2023: [SPOTT](#)

### Studies which assessed dependency on nature

- [Bank Negara Malaysia and World Bank study](#), March 2022: [An Exploration of Nature-Related Financial Risks in Malaysia](#)
- Banxico, 2021: [Dependencies and impacts of the Mexican banking sector on ecosystem services](#)
- Banque de France, August 2021: [A “Silent Spring” for the Financial System? Exploring Biodiversity-Related Financial Risks in France](#)
- De Nederlandsche Bank, June 2020: [Indebted to nature](#)
- Robeco, January 2022: [Robeco’s approach to biodiversity](#)
- [University of Cambridge Institute for Sustainability Leadership and AON](#), April 2022: [Mapping exposure to nature-related risks across financial indices – Nature-related financial risk use case](#)

### Water

- Aquanomics, 2022: [The economics of water risk and future resiliency](#)
- Carbon Disclosure Project, 2023: [CDP’s Water Impact Index](#)
- [CDP Water-related indicators for financial institutions](#)
- CDP, 2022: [Internal water pricing is changing how companies do business](#)
- [Ceres Investor Water Toolkit](#)
- Ceres, 2018: [Corporate Expectations for Valuing Water](#)
- Humanity United, 2015: [Free and Fair Labor in Palm Oil Production: Principles and Implementation Guidance](#)
- [Methodology for Water Risk Assessments of Equity Portfolios](#) (SouthPole, 2020)
- South Pole, 2020: [Methodology for Water Risk Assessments of Equity Portfolios](#)
- WWF and AstraZeneca, May 2023: [WWF Case Study Assessing Water Risk for Commodities](#)
- WWF Germany, 2023: [Water Risk Filter](#)
- WWF, 2020: [Water Risk in the Mining Sector report](#)
- WWF, 2021: [Diagnosing Current and Future Water Risks Facing the Pharmaceutical Sector](#)
- WWF, 2021: [Tackling Growing Water Risks in the Food Sector](#)

## Deforestation

- Deforestation Free Finance, 2021: [Global Canopy Finance Sector](#)
- Forest Trends, 2022: [Corporate Implementation, Impacts and Reporting on No Deforestation & “Nature Positive” Post 2020](#)
- Global Canopy, 2023: [Due diligence towards Deforestation-Free Finance](#)
- Global Canopy, 2023: [Forest 500](#)
- Principles of Responsible Investment (PRI), 2023: [PRI-Ceres Investor Initiative for Sustainable Forests](#)
- PRI: Investor expectation statement on deforestation in cattle supply chains
- PRI: Investor expectation statement on deforestation in soybean supply chains - final
- Stockholm Environment Institute, Global Canopy & Neural Alpha: [Trase Finance](#)
- Tropical Forest Alliance, 2022: [Investors Policy Dialogue on Deforestation Initiative](#)
- United Nations Framework Convention on Climate Change (UNFCCC), November 2021: [Financial Sector Commitment Letter on Eliminating Agricultural Commodity-Driven Deforestation FAQ \(COP26\)](#)
- World Resources Institute Land & Carbon Lab: [Global Forest Watch](#)
- WWF, 2020: [Deforestation Fronts](#)

## Soft-commodity sustainability standards

- [Better Cotton Initiative](#)
- [Cocoa & Forests Initiative](#)
- [Endorsement of Forest Certification \(PEFC\)](#)
- [Fair Trade](#)
- [Forest Stewardship Council \(FSC\)](#)
- [Fur Free Alliance](#)
- [Global Roundtable for Sustainable Beef](#)
- [Marine Stewardship Council \(MSC\)](#)
- [Organic](#)
- [Planet Tracker Seafood Databases](#)
- [Rainforest Alliance](#)
- [Roundtable on Responsible Soy](#)
- [Roundtable on Sustainable Palm Oil \(RSPO\)](#)

## Biodiversity footprinting tools

- [CDC Biodiversitat](#)
- [Fair Supply Biodiversity Loss Footprinting Tool](#)
- [Iceberg Data Lab](#)
- [ISS Biodiversity Impact Assessment Tool](#)
- [Partnership for Biodiversity Accounting Financials \(PBAF\)](#)

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