Marketing Communication for Professional Investors - June 2022

SUSTAINABLE BY NATURE SEQUEL: OUR PORTFOLIO BIODIVERSITY FOOTPRINT

BNP PARIBAS
ASSET MANAGEMENT

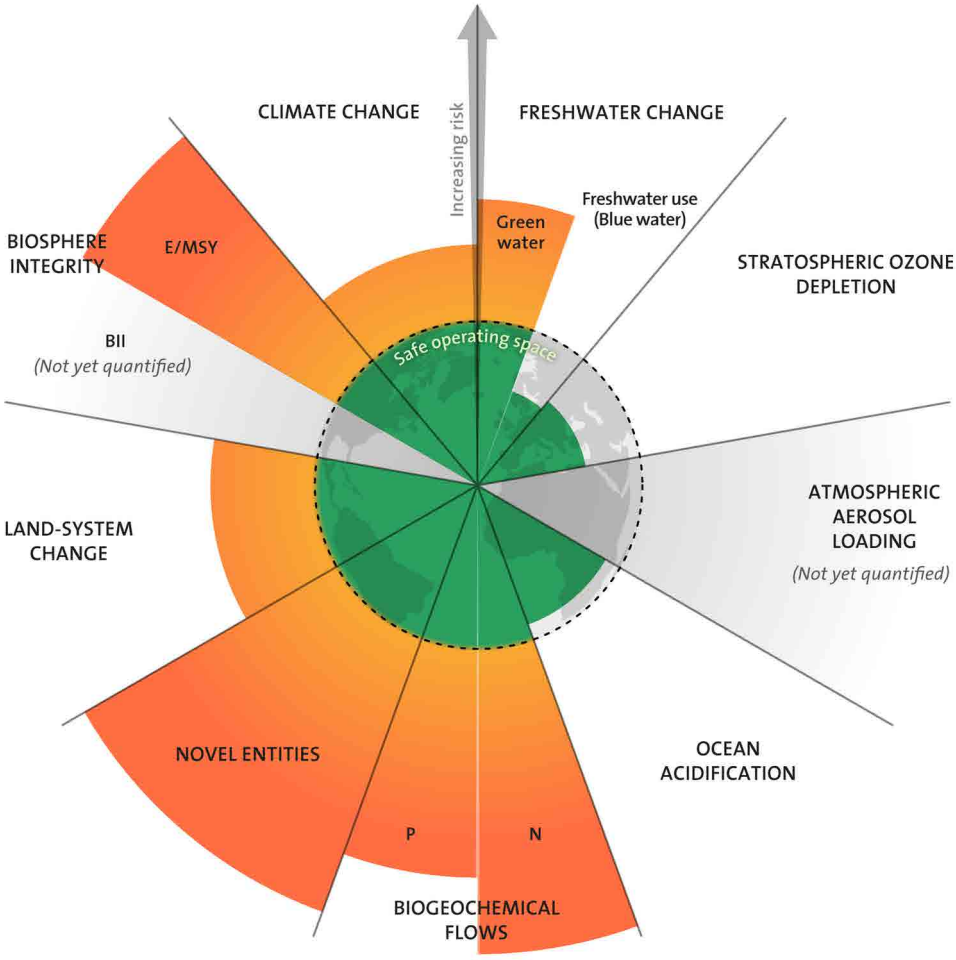
The sustainable investor for a changing world

CONTENTS

INTRODUCTION

In early 2022, scientists announced that the earth crossed six[1] of the nine planetary boundaries demarcating the safe operating space for humanity: Pollution from 'novel entities'[2], freshwater, climate change, biosphere integrity, biogeochemical cycles and land-system change. This unravelling of nature, now underway, poses an existential threat to humanity.

Figure 1: The nine planetary boundaries



Source: Stockholm Resilience Centre

As an asset manager with a broad range of clients who all depend upon a stable biosphere, we have a dual set of responsibilities:

- To understand how our investments impact nature – our role in driving this crisis
- How nature loss may translate into financial risks.

Just over a year ago, we published our biodiversity roadmap: "Sustainable by nature", detailing our views on the nature and urgency of this crisis and how we are actively responding to it. We used a variety of tools to understand our own dependencies and impacts on nature. In particular, we analysed our global assets under management (AUM) to understand our exposure to water and deforestation risks.

1. Freshwater boundary exceeds safe limits – Stockholm Resilience Centre
2. Outside the Safe Operating Space of the Planetary Boundary for Novel Entities | Environmental Science & Technology (acs.org)

One of the many consequences of water overconsumption, and more importantly, deforestation and unsustainable land management, is biodiversity loss. Biodiversity loss may affect societies, economies and ultimately investors, which is why we decided to complement our work on our water and deforestation footprints with additional data to capture a more complete picture of our exposure to, and impact on, global biodiversity loss.

There is a pressing need for both raw data from companies and the tools to help integrate this data into our investment decisions. The markets also require a consistent framework for understanding and reporting the full range of risks posed by biodiversity loss. Therefore, in March 2020, working with AXA Investment Managers, Sycomore Asset Management and Mirova, an affiliate of Natixis Investment Managers, we embarked on a competitive global search for a research firm that could provide a tool enabling investors to measure how their investments impact biodiversity.

We selected Iceberg Data Lab and I Care & Consult at the end of a structured tender process initiated by a public Call for Expression of Interest (CEI) and guided by a set of principles for the development of research tools. We are grateful for the support from nature-related experts at Global Canopy, WWF, ZSL, CDC Biodiversité, UNEP-WCMC and Capitals Coalition, to name only a few key partners that provided input to the initiative.

This paper presents initial findings from our efforts to use Iceberg Data Lab's research to determine a biodiversity footprint for our corporate holdings. This first phase of our analysis focuses solely on our negative impacts, without addressing our dependencies or the financial risks we face from nature loss, noting that we provided an initial assessment of our dependencies on ecosystem services in our biodiversity roadmap published last year.

The objective of this paper is to test biodiversity footprinting on the corporate holdings in our global portfolios in order to understand what it looks like, what it can be used for, and to identify the principal improvements that need to be made to the tool.

WHAT IS BIODIVERSITY FOOTPRINTING?

Biodiversity footprinting is an assessment tool that helps investors combine investees' modelled and reported data to quantify their potential biodiversity impact, without the need to measure actual biodiversity change on the ground, an impossible task for a large, globally diversified asset manager. As such, the footprint is a measure of negative impact – what are the potential impacts on nature represented by the companies in our portfolios? It does not, however, measure how dependent they are on nature, nor does it quantify the risks that arise from biodiversity loss.

The Iceberg Data Lab and I Care & Consult Corporate Biodiversity Footprint uses environmental input-output modelling and life cycle assessment data to quantify environmental pressures along the entire supply chain of a given company, using asset-level data where available. The GLOBIO3 model is then used to link quantified environmental pressures to biodiversity loss (expressed in km^2MSA, see box).

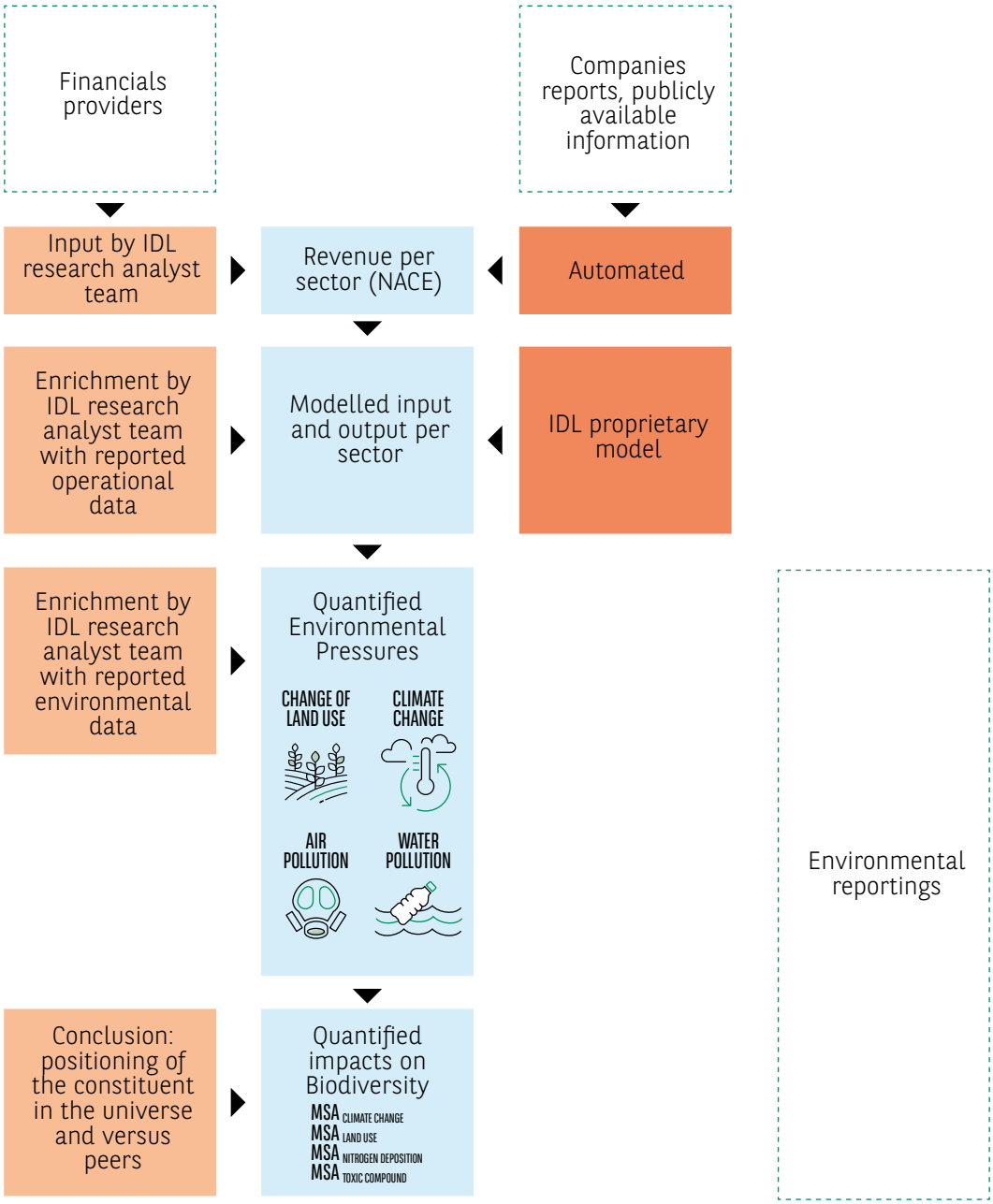
The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) has identified five direct drivers of (or pressures on) nature loss. The Corporate Biodiversity Footprint methodology currently covers the following pressures:

- Land use change (land occupation, transformation, encroachment and fragmentation)
- Air pollution through nitrogen and sulphur deposition
- Water pollution (eutrophication, acidification, ecotoxicity, plastic entanglement)
- Climate change.

Each environmental pressure is then translated into a quantified impact on biodiversity and aggregated to compute the Corporate Biodiversity Footprint of a given company, expressed in km^2MSA.

In summary, the quantified impact on biodiversity of a given company depends on three variables: The pressure to ecosystems (such as water pollution and land transformation, disclosed or modelled), the modelled severity of the disturbance induced and the affected surface area.

Figure 2: Iceberg Data Lab issuer-level biodiversity footprint calculation



Source: Iceberg Data Lab

Our assessment uses Iceberg Data Lab and I Care & Consult Corporate Biodiversity Footprint data V2.9 and relates to our assets under management (AUM) as of 31 December 2021. Corporate data covers the latest year available, primarily FY 2020.

Going from MSA to km²MSA – What does it mean and what does it tell us?

MSA (Mean Species Abundance) is one of the reference metrics used by the Convention on Biological Diversity (CBD) and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). It measures the average relative abundance of native species in a delimited space compared to their original abundance in undisturbed ecosystems.

MSA therefore captures the conservation status of an ecosystem in relation to its original state, undisturbed by human activities[3] and pressures. For instance, an area with an MSA of 0% will have completely lost its original biodiversity (or will be entirely colonised by invasive species) whereas an MSA of 100% indicates a level of biodiversity equivalent to a pristine, undisturbed ecosystem. An undisturbed desert or rainforest each has an MSA of 100%, despite significant differences in the naturally occurring abundance of species in these two very different ecosystems.

Linking environmental pressures to potential biodiversity impact, expressed by a *change in MSA*, is not simple, as it includes spatial and temporal dimensions: Over which area was the mean species abundance affected and for how long was it disturbed by the activities of a company within a given year?

The unit used in the Corporate Biodiversity Footprint is expressed in km²MSA, although in practice, this simple metric substitutes for a complex multi-factor model. The metric seeks to measure the *potential negative change in MSA* due to a company's operational and value chain impacts by translating total degradation of nature into square kilometres. The metric is a single unit of measurement used to understand the total potential negative impact of a company in spatial terms. If we could combine all of a company's negative impacts to nature, and express that in terms of square kilometres, how much 'artificialised' or 'denatured' land would that represent?

For example, a footprint of -100 km² MSA means that all the original biodiversity is lost over an area of 100 km² for one year. In practice, a lower proportion of biodiversity may be lost over a larger area, for example 10% over an area of 1 000 km² for one year, or 10% over an area of 100 km² for 10 years. For a responsible company with relatively low impacts, 100 km² may be a small fraction of the total land area associated with its value chain. This metric should not be interpreted as a precise representation of damage on the ground, but rather an indication of potential damage, based on a wide range of assumptions and models, to enable us to visualize total potential impact and compare one company to another.

And although it must be understood that all biodiversity is local, a variety of global events that cannot be localised – in particular, greenhouse gas (GHG) emissions – are having very significant impacts on local ecosystems. Currently, as well, corporate transparency relative to nature loss is poor – we do not have all of the data we need to accurately represent how specific operations affect a particular piece of land, or biome. We must thus use averages while recognising that precision is lost when we do so. While MSA is intended to measure a specific ecosystem, global averages represent something very different – for example, an average MSA between the American Midwest and the Amazon rainforest is not particularly meaningful.

The data that is available, however, can still help us to begin a journey towards a verifiably accurate footprint. For example, where companies disclose the source of their soft commodities, such as palm oil or soy, Iceberg Data Lab can use FAO[4] data to understand in-country conditions and yields to estimate the surface area covered. They can also plug in modelled data on pesticide use, when that information is not disclosed by the company. If a company discloses that X% of its paper sourcing is FSC[5] certified, then that can be taken into account. Each slight adjustment brings the picture into sharper focus. We can also use these data gaps to inform our data requests to corporations, which, in turn, encourages companies to set up systems to track and better manage their impacts on local ecosystems.

3. By 'human activities' we are primarily referring to the impacts created by large industrialised societies. We recognise that indigenous peoples around the world have served as effective stewards of nature and continue to do so.
4. United Nations Food & Agriculture Organization
5. Forest Stewardship Council

POTENTIAL BIODIVERSITY IMPACT OF OUR CORPORATE INVESTMENTS

For this analysis, we focused on two asset classes of our corporate investments – equities and fixed-income[6] securities we hold in publicly-traded companies, which we refer to as Corporate AUM. This analysis does not include asset classes such as sovereign debt, municipal bonds, private debt or real assets.

To report on the potential biodiversity impact of our Corporate AUM, we use the following overarching key performance indicators:

1. Coverage and Data Quality Measures
   A. Coverage levels
   B. Data quality levels

2. Biodiversity Measures
   A. Absolute biodiversity footprint of the companies in which we invest (without taking into account our ownership share)
   B. Absolute biodiversity footprint of our Corporate AUM (taking into account our ownership[7])
   C. Financed biodiversity footprint of our Corporate AUM per million EUR invested
   D. Biodiversity intensity of our Corporate AUM (per unit of capital employed)

Results refer to our full Corporate AUM. We also give an example of three funds and plan to scale up this type of analysis in the future.

1. Coverage and data quality levels

A. Coverage levels

Satisfactory. We were able to retrieve Corporate Biodiversity Footprint (CBF) data for 1 800+ corporate issuers in our equities and fixed-income portfolios, representing 70% of our Corporate AUM. Given the novelty of biodiversity footprinting, we consider this coverage satisfactory, but we will aim to improve it over time.

B. Data quality levels

Average. Iceberg Data Lab (IDL) calculates a data quality score for each issuer, with the score ranging from 1 (best) to 4 (worst). IDL is seeking useable quantitative data across each company's entire value chain.

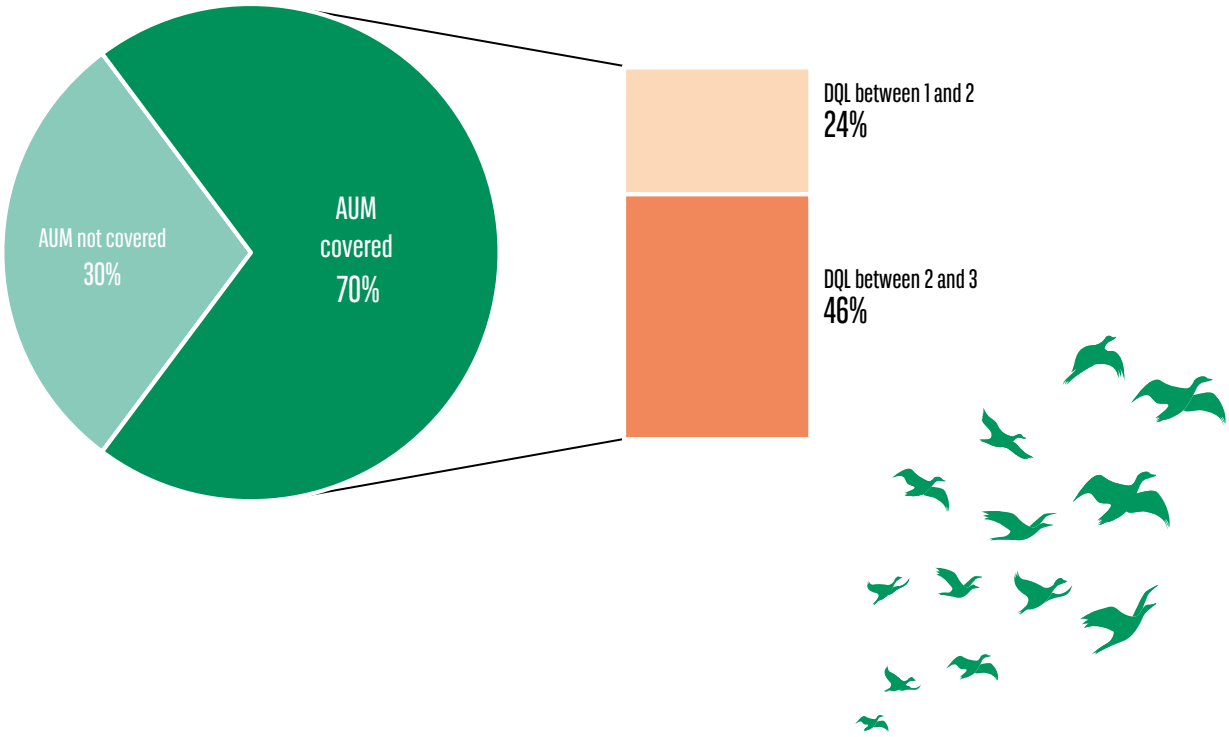
- The average data quality score of the issuers in our portfolios is 2.7, with variations at the sector level. This means that CBF modelling is mostly based on the revenue and sector exposure of issuers rather than consumption and production data, let alone reported quantitative data on environmental pressures.

- Scope 1 and 2, GHG emissions are, unsurprisingly, the biodiversity pressure on which issuers report useable quantitative data. Environmental pressures for 24% of total Corporate AUM were modelled using production and consumption data (overall data quality level equal to or lower than 2), with the remainder modelled using revenue and sector exposure.

  "Scope 1" refers to the direct pressures generated by a company, for GHG emissions they come from the combustion of fossil fuels, or chemical reactions, for Land Use they are linked to surface artificialised or occupied directly by the company. "Scope 2" refers to the pressures of a company induced by its electricity, heat, and cooling purchase. "Scope 3" refers to all indirect pressures induced by the activity of a company.

6. Including Asset-Backed Securities
7. Using Enterprise Value as for Carbon Footprinting to allocate between corporate bonds and listed equity

Figure 3: AUM coverage and data quality levels (DQL)



Data quality level indicator

With each data point, a Data Quality Level indicator (DQL) is calculated. This shows the sources used for the calculation and the transparency level of the analysed corporate or asset, so the indicator reflects the degree of uncertainty of the final result.

Four levels of input data quality are available:

- DQL of 1: Environmental pressure data, such as hectares of land occupied or tonnes of GHGs emitted in a specific year, are considered best when reported by companies
- DQL of 2: If no environmental data is reported, consumption and production data for specific products, such as specific agricultural commodities, plastics or fuels, is used to model environmental pressures
- DQL of 3: If only sales are reported, the volumes are modelled using a customised Input/ Output model
- DQL of 4: When no data is available, a biodiversity footprint is modelled from a sectoral average of IDL's dataset.

2. Biodiversity measures

A. Absolute biodiversity footprint of the companies in which we invest (without taking into account our ownership share)

We estimate that the total absolute biodiversity footprint of the companies in which we are invested (without taking into account our percentage ownership) is approximately **-6 million km²MSA**, which means that the activities of these companies and their value chains potentially maintain a fully degraded area equivalent in size to most of Europe, annually.

Formula used to calculate A:

$$A = \sum_{i=1}^{n} CBF\ Value_i$$

With:
i: a corporate issuer in which BNPP AM invests that is covered by IDL
n: we were able to retrieve CBF data for 1,800+ corporate issuers
CBF Value$_i$: Corporate Biodiversity Footprint of corporate issuer *i* (source = IDL)

B. Absolute biodiversity footprint of our Corporate AUM (taking into account our ownership[8])

When seeking to attribute this figure to our share of investments, using the Partnership for Biodiversity Accounting Financials (PBAF)[9] 'follow the money' principle and Enterprise Value[10], we find that our financed absolute biodiversity footprint is approximately **-8 000 km²MSA**, which means that our investments potentially maintain a fully degraded area equivalent to five times the size of London, annually.

Formula used to calculate B:

$$B = \sum_{i=1}^{n} AUM_i \text{ x } \frac{CBF\ Value_i}{Enterprise\ Value_i}$$

With:
AUM$_i$: amount invested by BNPP AM in corporate issuer *i* (source = BNPP AM)
Enterprise Value$_i$: Market Capitalization + Total debt for company *i* (source = Worldscope)

C. Financed biodiversity footprint of our Corporate AUM per million EUR invested

Our financed absolute biodiversity footprint is approximately **-0.06 km²MSA per million EUR invested**, which means that for each million EUR invested in our funds, six fully degraded hectares are potentially maintained each year.

These figures should be understood as orders of magnitude rather than taken at face value, and represent the best of our knowledge and modelling capabilities at the time of writing. They are prone to multiple-counting (estimated at over 70% by IDL), although this may vary depending on sector allocation and the specific stocks we invest in.

8. Using Enterprise Value as for Carbon Footprinting to allocate between corporate bonds and listed equity
9. The Standard | PBAF – Partnership for Biodiversity Accounting Financials (pbafglobal.com)
10. We use the following definition: Enterprise Value = Market Capitalization + Total debt.

Formula used to calculate C:

$$C = \sum_{i=1}^{n} \frac{AUM_i}{\sum_{i=1}^{n} AUM_i} \text{x} \frac{CBF\ Value_i}{Enterprise\ Value_i}$$

D. Biodiversity intensity of our Corporate AUM (per unit of capital employed)

The average biodiversity intensity of the companies in which we invest: We define biodiversity intensity as the mean species abundance loss, in km²MSA, per unit of capital employed. Capital employed, rather than revenue or net sales, was used following the recommendations of IDL to compare companies throughout our universe from an investment intensity standpoint.

Formula used to calculate D:

$$D = \sum_{i=1}^{n} \frac{AUM_i}{\sum_{i=1}^{n} AUM_i} \text{x} \frac{CBF\ Value_i}{Capital\ Employed_i}$$

With:
Capital Employed*$_i$*: capital employed for company i (source = IDL)

- Interestingly, our Corporate AUM's biodiversity intensity (weighted by AUM) is about two-thirds of the unweighted biodiversity intensity of the issuers in our investment universe. It is also approximately **15% lower** than that of the MSCI ACWI.

This shows that we are relatively less invested in issuers with higher biodiversity impact.

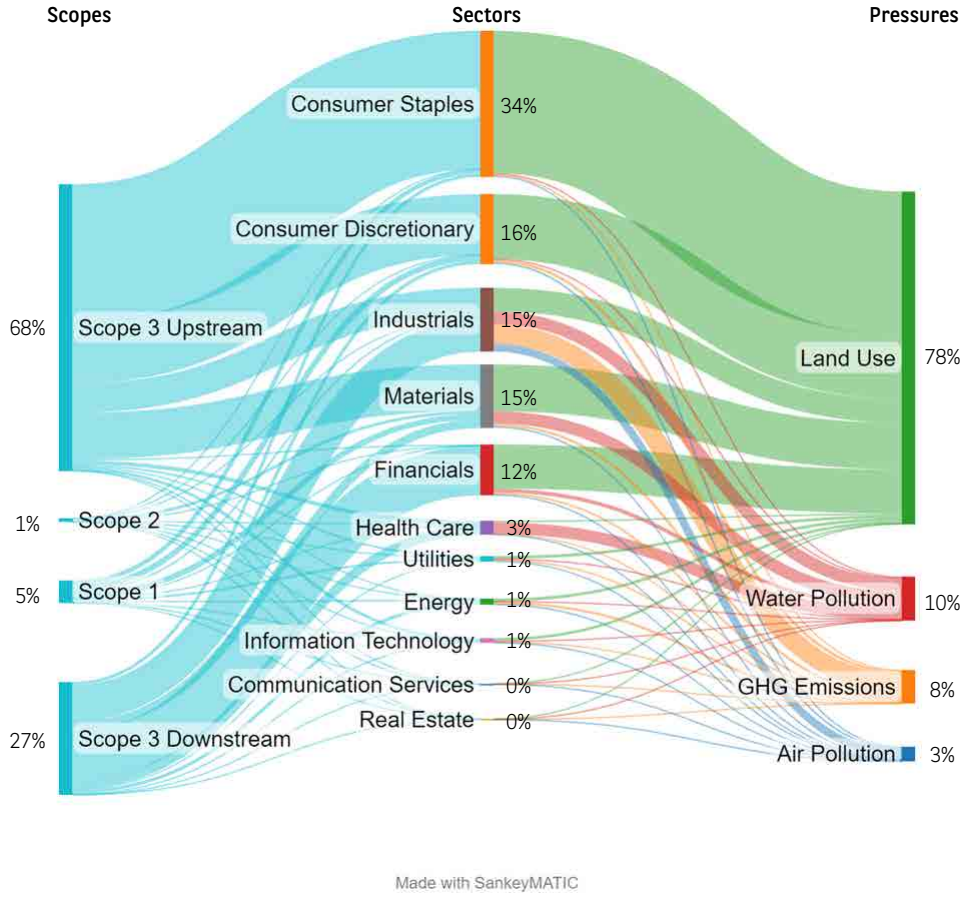
- Our Corporate AUM's direct[11] biodiversity intensity is approximately -0.01 km²MSA per million EUR of capital employed (weighted by AUM). When including value chain impacts, this figure rises to **-0.15 km²MSA per million EUR of capital employed.**

This highlights one of the main biodiversity challenges for investors: Impacts are predominantly situated within value chains, but issuers do not provide the information and traceability required for investors to properly manage these impacts.

- **Land use change is the main environmental pressure**, contributing approximately 80% of the weighted biodiversity intensity of our Corporate AUM, followed by water pollution (10%), climate change (8%) and air pollution (3%). This is roughly in line with IPBES results at a global level, but excludes key pressures such as resource overexploitation and invasive species.

11. "Direct" refers to Scope 1, or operational impacts.

Figure 5: Relative contribution[12] of each value chain scope, sector and pressure to our weighted biodiversity intensity



Source: Made with SankeyMATIC based on BNPP AM analysis

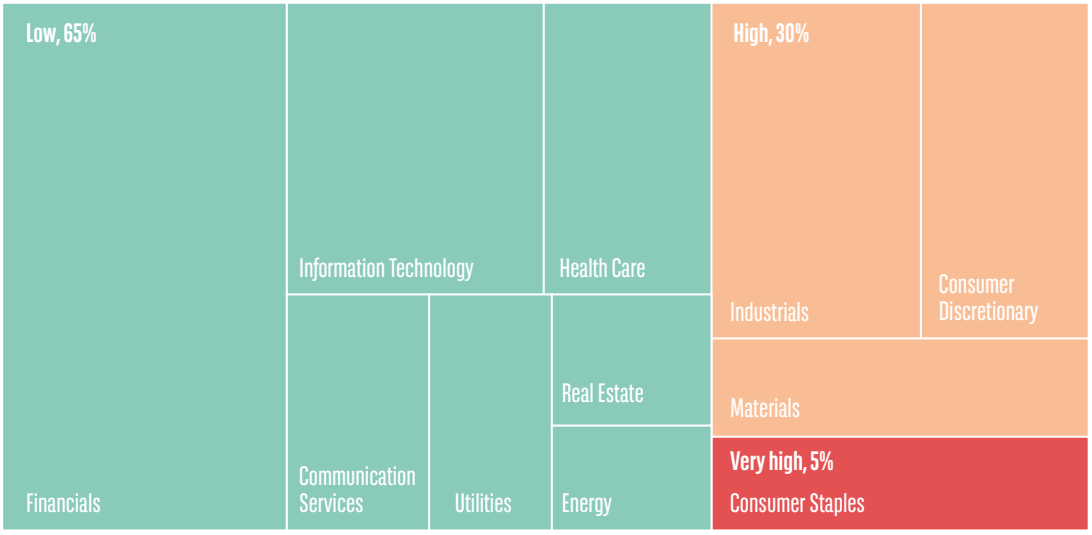
- The consumer staples, consumer discretionary, industrials and materials sectors are the principal contributors to our Corporate AUM weighted biodiversity intensity, which is mainly due to the biodiversity intensity of their Scope 3 impacts. Our Corporate AUM's primary contributions to nature loss are through the impacts of land use change, followed by water pollution, greenhouse gas emissions and air pollution.

The aggregated biodiversity footprint hides large sectoral disparities.

Figure 6 displays the biodiversity intensity of our aggregate corporate equity and fixed-income investments, where the size of the box represents the relative portion of our AUM. The color represents the relative biodiversity intensity by Global Industry Classification Standard (GICS) sectors. Darker red signifies higher intensity.

12. The sum of contributions by scope (sum = 101%), sectors (sum = 98%) and pressures (sum = 99%), differs from 100% due to rounding effects.

Figure 6: Relative biodiversity intensity (per capital employed) by GICS sector, weighted by AUM



Low = below -0.20 km²MSA per million EUR capital employed
High = between -0.20 and -0.50 km²MSA per million EUR capital employed
Very High = above -0.50 km²MSA per million EUR capital employed

Based on our analysis, when looking at the chart, we note some key takeaways:

- **More than 65% of our Corporate AUM is invested in sectors with a low biodiversity intensity**. This is mostly due to our high exposure to the financials sector, which has a relatively low biodiversity intensity (per million EUR capital employed), even when taking into account financed biodiversity impact. Interestingly, when looking at our biodiversity intensity per million EUR sales, the financials sector has one of the highest biodiversity intensities, which illustrates the importance of choosing the right intensity metric.

- **Consumer staples has the highest biodiversity intensity (per million EUR capital employed) – mostly due to land use change – and represents over 5% of our AUM**, followed by the materials, industrials and consumer discretionary sectors. Surprisingly, the energy and utilities sectors have relatively low biodiversity intensity – although with large variations among issuers – mostly attributable to the energy mix and associated emissions of GHGs and other air pollutants. Figure 7 below highlights the most material biodiversity impacts for selected sectors.

- We find that **in most sectors, our average biodiversity intensity (weighted per AUM, see formula D) is lower than the sector-level average (unweighted),** suggesting that within most sectors, we are more invested in companies that have a lower biodiversity intensity[13]. This is particularly true for the consumer discretionary sector, where our (weighted) average biodiversity intensity is about half the sector average. On the other hand, our (weighted) average biodiversity intensity is higher than the sector average for the energy, industrials and utilities sectors.

While today no measure of biodiversity impacts can be considered comprehensive, we believe IDL's assessment has captured many of the most material impacts on biodiversity at the sector level (Figure 7).

13. For intra-sector comparison and engagement, it may be necessary to analyse the data at a more granular level and compare sector intensity/company-level intensity based on their biodiversity intensity per unit of production rather than revenue.

Figure 7: Selected sectors: Biodiversity impact deep-dive

The most material impact of the Food sector.

LAND USE CHANGE

- To grow agricultural raw materials, large areas of land are needed which results in a high impact on biodiversity.
  - The most material commodities are products of meat. Indeed, the impact on land use, linked to the cultivation of the raw materials used to feed them, is very high.
- Intensive monoculture has a high impact on soil erosion and degradation of species richness or abundance.
- Moreover, highly intensive production systems that rely on irrigation, drainage and soil levelling practices degrade natural ecosystems.

AIR POLLUTION

- Sulphur dioxide and nitrogen oxides emissions coming from fertilizers participate in the acidification and eutrophication of soils which have an important effect on the degradation of vegetation and the appearance of invasive species that inhibit the others.

FRESHWATER ECOTOXICITY

- Conventional agriculture, which uses high levels of fertilizers and pesticide applications, has a negative impact on soil fertility and species diversity.

GHG EMISSIONS

- Livestock farming, and especially beef farming, is a major emitter of GHG emissions. This is due to the production, and often the importation, of raw materials to produce their food (soy, corn, etc.). Livestock farming also emits greenhouse gases like methane, which have a very important impact on global warming.
- Agricultural products resulting from deforestation (beef, soy, cocoa, etc.) are also high emitters of greenhouse gases and have a dramatic effect on the climate.

The most material impacts of the oil and gas sector.

GHG EMISSIONS

The most material impact arises from the final use and combustion of natural gas and petroleum products. Extraction, processing and transport also require energy input. Methane emissions through flaring and fugitive emissions contribute to the high GHG emissions of the sector.

LAND USE AND LOCAL IMPACT

For the extraction of crude oil and natural gas, tools like wells are needed to access the fuels from the surface. In case of oil sands, a large land surface is needed to access the oil. Refineries, storage, transportation, distribution and infrastructure also require land to be artificialized and fragmented.

AIR POLLUTION

Through the combustion of fossil fuels, high levels of air pollutants like NOx and SOx are released which leads to acidification.

WATER AND SOIL POLLUTION

Crude oil contains many pollutants which are hazardous to water. In case of oil spills, hazardous substances can bioaccumulate in living organisms or pollute the water for decades.

Source: Iceberg Data Lab

SELECTED PORTFOLIO BIODIVERSITY FOOTPRINT

Figure 8 shows results and coverage levels for one equity portfolio, one fixed-income portfolio and one thematic portfolio. We plan to scale up this assessment in the future.

Figure 8: Selected fund-specific results*

Portfolio			Benchmark			Fund Difference vs Benchmark (%)
	CBF Coverage	Biodiversity footprint per million euro invested (km^2MSA, rebased at 100% coverage)		CBF Coverage	Biodiversity footprint per million euro invested (km^2MSA, rebased at 100% coverage)	
BNP Paribas Funds Sustainable Euro Corporate Bond Group	61%	-0.05	Bloomberg Barclays Euro Aggregate Corporate Index	58%	-0.06	-14%
BNP Paribas Actions Monde ISR	87%	-0.07	MSCI ACWI	88%	-0.06	+28%
BNP Paribas Funds Ecosystem Restoration	20%	-0.02	MSCI ACWI	88%	-0.06	-63%

The investments in the funds are subject to market fluctuations and the risks inherent in investments in securities. The value of investments and the income they generate may go down as well as up and it is possible that investors will not recover their initial outlay, the funds described being at risk of capital loss.
For a Complete description and definition of risks, please consult the last available prospectus and KIID of the funds . Investors considering subscribing to a fund should read carefully its most recent prospectus and KIID that can be downloaded free of charge from our site.

Of the three portfolios assessed, BNP Paribas Funds Ecosystem Restoration has a lower biodiversity footprint than its benchmark. Ecosystem Restoration is a thematic fund, with the objective of helping to restore our oceans, lands and urban communities by investing in companies that are engaged in improving aquatic, terrestrial and urban ecosystems, through their products, services or processes.

Yet, the results are not due to the positive focus of the fund. IDL's methodology only takes into account negative impacts, with the positive impact measurement not yet captured in the methodology (planned for the end of 2022).

The results show that companies comprising part of this portfolio are likely to have a lower potential negative impact through their operations and value chains than others, on average, in any sector. In performing attribution analysis, we find that the difference is mainly due to stock selection rather than sector allocation. **Results are very uncertain given the low coverage level**.

While we find that comparing funds with their benchmarks to be an interesting exercise, the results bear further investigation and the model needs further refinement for us to draw more robust conclusions.

SO WHAT? LOOKING AHEAD

This first biodiversity footprint assessment enables us to establish a baseline against which we can monitor our future performance. It also provides a high-level compass to identify where closer analysis of individual issuers is warranted. This complements the suite of tools and analysis our ESG analysts perform at the sector and issuer level, and helps to identify key targets for direct engagement by our stewardship team and portfolio managers.

We are optimistic about the usefulness of this analysis, but do wish to highlight that many challenges remain ahead. Biodiversity in or beneath the soil, novel entities, marine biodiversity, extinction risk and species richness dimensions have not yet been fully captured, and some pressures, such as invasive species and resource overconsumption, have yet to be modelled. This is not to say that scientists do not have good data on these aspects of the problem, but there is still a lack of data that is usable by investors, linking specific impacts to individual companies. This is a significant blind spot, as we understand that companies are directly connected to each of these additional pressures.

USE CASES

- The calculation of our biodiversity footprint allows us to quantify our potential impacts on biodiversity and better understand the most likely impactful sectors and pressures.
- The methodology goes further than sector-based materiality assessments as it integrates company-specific data, where available, and weights pressures based on the potential severity and scale of their impact on biodiversity to produce a single metric, km^2MSA.
- Because business measurement and reporting on biodiversity are extremely limited, sharing our experience of calculating our biodiversity footprint contributes to critical knowledge, while bringing innovation and transparency to scientifically robust and consistent measurement of biodiversity impact.
- Our biodiversity footprint analysis is compatible with the TNFD[14] beta framework. As the LEAP[15] approach for financial institutions (LEAP-FI) is being designed, we intend to share our analysis with our peers, as well as continuing to exchange views with CBF Steering Committee members, especially our close partners AXA IM, Mirova and Sycomore.
- The calculation of our biodiversity footprint allows us to respond to the requirements of Article 29 of the French Law on Energy and Climate regarding biodiversity measurement and reporting.

KEY ATTENTION POINTS

- Biodiversity footprinting captures potential impact on biodiversity rather than actual impact on the ground, as it relies on models such as GLOBIO. For high-impact companies and activities, it is therefore necessary to complement this metric with actual, measured data.
- Not all drivers of biodiversity loss are included in this version of our biodiversity footprint calculation, which may change the order of preference between sectors and companies. The CBF methodology of IDL is evolving to include additional key biodiversity pressures, such as invasive species, water consumption and resource overexploitation.
- The calculation of our biodiversity footprint is not responsive to the local characteristics of ecosystems as IDL's CBF methodology does not distinguish between pristine ecosystems with higher and lower biodiversity abundance levels (e.g., undisturbed desert or rainforest). This means that the potential impact calculated must be interpreted with care and complemented with other metrics that capture the biodiversity importance of specific locations.
- Environmental pressures are usually calculated based on environmental input-output modelling and life cycle assessment. Where averages are used, the results may not distinguish between companies within the same sector. Biodiversity footprinting may therefore be complemented with other metrics to support intra-sectoral ranking.

14. Taskforce on Nature-related Financial Disclosures
15. Locate, Evaluate, Assess, Prepare. https://framework.tnfd.global/the-leap-nature-risk-assessment-process/

As we consistently affirm, collaboration is a must on this data journey. We are playing our role as active stakeholders in many biodiversity initiatives and partnerships, such as Capitals Coalition, TNFD, PBAF, ALIGN, WWF Biodiversity Risk Project, Aligned Accountability, and CDP Biodiversity, as well as in co-establishing the forthcoming Nature Action 100.

As we move ahead, we continue to encourage our most biodiversity-impactful investees to disclose useable quantitative data on biodiversity pressures, such as tonnes of GHGs emitted or hectares of land converted. This has significant synergies with our other work on environmental footprinting as established in our Global Sustainability Strategy, in particular our Carbon, Water and Forest footprinting efforts.

We further encourage data providers to attempt to align their biodiversity measurements with the recommendations of the PBAF and ALIGN frameworks. Particular attention should be paid to spatial precision and accuracy, responsiveness to a company's mitigation and feasibility to apply at scale. We also invite data providers to develop methodologies for measuring positive impact, which is an integral part of assessing overall impact on biodiversity.

We plan to investigate the links between issuer-level biodiversity footprint and the other indicators we use to steer our investments, such as the 'E' components of our ESG scores. This would allow us to identify complementarities and advance the convergence of tools we employ internally. Our proprietary ESG scoring framework is instrumental to our ability to generate long-term sustainable investment returns for clients, while having a positive impact on the environment, the economy and society.

Finally, we will persevere in our efforts to reduce the negative impact of our investments on biodiversity, in particular on land use change – for example through our no-net-deforestation commitment.

SFDR and Article 29 of French Law on Energy and Climate

The REGULATION (EU) 2019/2088 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 November 2019 on sustainability-related disclosures in the financial services sector requires financial market participants to consider the principal adverse impacts of investment decisions on sustainability factors. In particular, adverse sustainability indicator number 7 relates to the share of investments in investee companies with sites/operations located in or near biodiversity-sensitive areas, where activities of these investee companies negatively affect those areas. We are currently assessing third-party data vendor (including IDL) offerings related to this indicator.

This paper will also allow us to respond to French regulation requirements. Indeed, the new decree under Article 29 of the French Law on Energy and Climate extended climate risk reporting requirements to include biodiversity related risks. Accordingly, effective from June 2022, asset managers will be required to report on their alignment strategy with long-term biodiversity targets.

Case study: linking biodiversity footprinting and our work on deforestation

Last year, we published the first results of a deforestation assessment we performed across our corporate investment universe, where we combined a range of sources (such as CDP Forest, SPOTT and Forest 500) to assess the strength of no-deforestation commitments.

Deforestation is a key driver of land use change, contributing approximately 80% of our Corporate AUM biodiversity footprint. We thus attempted to combine issuer-level land use change biodiversity footprints with an assessment of the strength of their no-deforestation commitments to identify issuers with potentially high impact and weak commitments.

While the sample size is relatively low (139 issuers), we find that on average, issuers with weak or no deforestation policy tend to have a higher land use change biodiversity intensity (Figure 9). Consequently, this type of assessment is useful in prioritising further research and engagement.

Figure 9: Links between the strength of issuers' no-deforestation policy and land use change biodiversity intensity

Strength of Deforestation policy	Coverage (number of issuers)	Average km^2MSA / m EUR capital employed (land use change)
Null	91	-0.72
Partial	38	-0.53
Full	10	-0.30

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