



Commonwealth  
Climate and  
Law Initiative

## Biodiversity Risk: Legal Implications for Companies and their Directors

Commonwealth Climate and Law Initiative  
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## About the Commonwealth Climate and Law Initiative

The Commonwealth Climate and Law Initiative (**CCLI**) is a legal research and stakeholder engagement initiative founded by Oxford University Smith School of Enterprise and the Environment, ClientEarth and Accounting for Sustainability (A4S). We are a UK non-profit organisation funded by environmental philanthropy and research grants. More information [here](#).

We apply existing company law to climate and biodiversity risk in order to drive a rapid and orderly transition towards a net zero carbon and nature positive economy. We examine the legal basis for directors and trustees to manage and report on climate change, biodiversity and broader environmental risks. Our legal research is at the forefront of the intersection of climate and biodiversity risks under existing companies and securities laws. We commission legal opinions from independent experts within a jurisdiction to build the authoritative evidence base on which to shift mainstream understanding of the requirements of corporate and securities laws to nature crises. We convene conferences, host webinars and stakeholder events to disseminate our findings and build capacity across the corporate, regulator and civil society ecosystem. Our approach is outcome-focused and evidence-led. We have partnered with world-leading behavioural science consultancy, Influence at Work, to undertake research on the role that psychology plays in understanding how boards engage with the subject of climate change in the boardroom.

We collaborate with leading organisations, such as the World Economic Forum, the Law Society of Singapore, the Society of Indian Law Firms and the C.D. Howe Institute.

Our Canadian partner, the Canada Climate Law Initiative, convenes 60 experts to educate Canadian boards on climate change under the Canadian Climate Governance Experts project. They also provide an online knowledge hub for climate risk and sustainable finance resources.

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## Disclaimer

This publication has been prepared for educational purposes only and the information contained within it is of a general nature. This document is not, and is not intended to be, legal advice. Board directors should seek legal advice on the unique circumstances of their company and jurisdiction.

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## Executive summary

**This paper analyses the relevance of biodiversity risks to companies and economies in the discharge of directors' legal duties globally. The executive summary summarises an extended analysis in the main paper. Please read its conclusions in the context of the full paper.**

**The risk of biodiversity loss can present foreseeable and material financial risks and opportunities to individual companies and the wider economic and financial systems.**

The functioning of the global economy and the actors within it depend upon the services supplied by healthy ecosystems, which depend on rich biodiversity. The value of ecosystem services themselves is estimated at US\$125-140 trillion per year.<sup>1</sup> US\$44 trillion of economic value generation (over half of global GDP) is moderately or highly dependent on ecosystem services.<sup>2</sup> This remains generally unaccounted for in mainstream economic and accounting practices. At the same time, biodiversity loss is occurring at an accelerating rate, 100 to 1,000 times higher than that of the past million years.<sup>3</sup> This can constitute a risk to economic activities and financial assets that may arise from modest tipping points and reverberate through entire sectors and financial systems.<sup>4</sup> There is international consensus on the financial and systemic materiality of biodiversity risk.<sup>5</sup>

Biodiversity is the variability among living organisms. Many companies have direct or indirect **dependencies** on biodiversity through the critical (and often hidden) value of ecosystem services. Companies can be responsible for significant direct or indirect **impacts** on biodiversity. This includes habitat loss and degradation due to land use; over-exploitation of natural resources; water, land and air pollution; contributions to human-induced climate change; and introduction of invasive alien species, all scientifically described as direct drivers of biodiversity loss.<sup>6</sup> These drivers upset ecosystem equilibria, impairing ecosystem services. A company's biodiversity impacts may affect ecosystems on which its own business, other companies and society depend. Companies' dependencies and impacts on biodiversity can lead to financial **risks**, conceptualised as physical, transition and legal risks. These risks may affect a company's business and financial performance. Corporate dependencies and impacts on biodiversity can lead to **opportunities** to manage transition risks and improve a company's business prospects. For example, through 'natural capital' value, improving brand value or by finding new business models.

While there are many industries with material biodiversity impacts and dependencies, much of the focus has been on agriculture, construction and food and beverages. These sectors have value chain links to many other industries. Their impacts and dependencies on biodiversity can constitute latent risks for many others. Many sectors have high or medium biodiversity risk exposure directly and/or indirectly through their value chains. For example, through products that use agricultural materials (e.g. cotton), forest materials (e.g. paper, cosmetics), mined materials (e.g. minerals in batteries), or plant ingredients (e.g. pharmaceuticals).

<sup>1</sup> OECD, [Biodiversity: Finance and the Economic and Business Case for Action](#) (2019) 9, 12, 26; Costanza, R. et al. Global Environmental Change, Vol. 26, [Changes in the global value of ecosystem services](#) (2014) 152-158.

<sup>2</sup> World Economic Forum, [Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy](#) (January 2020).

<sup>3</sup> Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, [The Global Assessment Report on Biodiversity and Ecosystem Services](#) (2019)

<sup>4</sup> NGFS and INSPIRE, [NGFS Occasional Paper: Central banking and supervision in the biosphere: An agenda for action on biodiversity loss, financial risk and system stability](#) (March 2022).

<sup>5</sup> Network for Greening the Financial System (NGFS) and INSPIRE, [Central banking and supervision in the biosphere: An agenda for action on biodiversity loss, financial risk and system stability](#) (2022); UN Principles for Responsible Investment, [Investor Action on Biodiversity](#) (2020); the Task Force on Nature-related Financial Disclosures, [Nature in Scope](#) (2021); World Economic Forum, [Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy](#) (2020); the OECD, [Biodiversity: Finance and the Economic and Business Case for Action](#) (2019). Also from governments and national central banks, see [Appendix 1](#) for references.

<sup>6</sup> Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, [Models of drivers of biodiversity and ecosystem change](#) (last accessed 10 November 2022).

### Social, regulatory and legal context may influence the standard required to fulfil directors' duties.

Generally, fiduciary obligations require directors to act with **care and loyalty** to their companies. These duties are exercised in strategic planning, oversight of foreseeable and material risks, and attesting to disclosure and financial reports. The law commonly assesses the standard of directors' care and loyalty by reference to market, social and regulatory context, which may raise the standards applicable to directors of certain companies. **Evolving context may inform directors on current interpretation of these duties:**

- Developments in global biodiversity targets at the fifteenth conference of the parties to the UN Convention on Biological Diversity in December 2022 (**COP15**) may influence social expectations of companies. It may also create commitments for governments to require businesses to assess and report on their biodiversity dependencies and impacts, which could create a regulatory transition risk.
- The Task Force on Nature-related Financial Disclosures (**TNFD**) and the International Sustainability Standards Board (**ISSB**) may lead to companies being obliged to make biodiversity risk disclosures. Investors' attention to biodiversity may affect duties of disclosing companies and, through market practice, other companies. The International Accounting Standards Board (**IASB**) indicated that companies may have to disclose material emerging environmental risks in financial statements.
- Investor frameworks indicate growing appetite by the world's biggest investors to manage biodiversity risk. This may lead to investors requesting companies to set targets for nature or disclose biodiversity related lobbying activities. This would signal that investors deem biodiversity issues to be material.
- Courts are considering biodiversity-related cases against companies. Some relate to subsidiaries or value chain partners across the world. Litigants could also bring biodiversity-related cases against directors.
- Proposed and enacted environmental due diligence legislation around the world is likely to cascade information requests through value chains. This may influence global best practice.
- Developments in natural assets, impact investing and natural capital accounting are bringing biodiversity into the financial mainstream. Legal recognition of the rights of nature presents an emerging legal risk.

Well informed, prudent directors will embed proactive risk governance to identify, manage and disclose biodiversity dependencies, impacts, risks and opportunities. Shrewd directors may identify opportunities arising from biodiversity that increase the company's long-term viability. ([Appendix 2](#) gives practical examples of the relevance of biodiversity risks and opportunities for the long-term success of companies).

### Foreseeability and materiality of biodiversity risks.

Regulatory or contractual **obligations to disclose** biodiversity dependencies, impacts, risks and opportunities **may further influence the standards of care and loyalty that directors must apply**. This can apply to companies making biodiversity disclosures and, by altering market perceptions, a wider group of companies. Companies' disclosure requirements are generally defined by reference to materiality (i.e. whether a reasonable investor would find information 'decision-useful'). Disclosure recommendations indicate elevated investor concern about relevant risks and opportunities. This may elevate the standards of care and loyalty. 'Single materiality' considers risks posed to a company. 'Double materiality' considers risks posed to and by the company. Evolving definitions of materiality, such as in the draft TNFD framework, indicate that directors may have to embed consideration of the company's dependencies, impacts, risks and opportunities into risk governance and when signing off on company disclosures. **Even company impacts on biodiversity that do not pose a quantitatively significant or material risk or opportunity to the company, may require governance and disclosure** ('double materiality').

Developments in 'double materiality' are significant because directors' duties are traditionally focused on the success of the company in priority to, or exclusion of, the world at large. Companies would not historically

be expected to consider their impacts if they did not, prima facie, translate into a material effect on their prospects or performance. Investors may now consider companies' impacts qualitatively important in their own right, so that (alongside risks) they may fall within the scope of the directors' duty of care and loyalty.

**The relevance of a company's biodiversity impacts and dependencies to corporate governance practices turns on foreseeability of risk and the interpretation of materiality.**

- Companies' **dependencies** on biodiversity can create foreseeable and financially material **risks and opportunities** to the company **that fall within directors' governance and disclosure practices.**
- Companies' biodiversity **impacts** can occur in ecosystems on which the company does or does not depend and may affect other parties. Both can **create foreseeable and financially material risks and opportunities** to the company **that fall within directors' governance and disclosure practices.**
- Even companies' biodiversity **impacts that do not create any foreseeable and material risks or opportunities** to the company **can still fall within directors' governance and disclosure practices.** This is an open question that will require directors to consider context and use business judgement.

**In order to discharge their duties and disclosure obligations, directors can ensure that risk management processes assess foreseeable biodiversity dependencies and impacts of the company for materiality and measure those that are material. Directors can then include material dependencies, impacts, risk and opportunities within strategy, disclosure and decision-making.**

**Directors may face the risk of liability for a failure to consider biodiversity risks in governance and disclosure if this breaches the duties of care or loyalty.**

While courts are seeing an increase in climate litigation and some biodiversity claims, this does not suggest that there is currently a high level of legal risk for directors who do not consider biodiversity. However, avoidance of liability is a low bar. Directors will want to avoid or mitigate reputational issues and aim for prudent governance and best practice to perform their role successfully with integrity.

**The standard for directors will depend on the jurisdiction and factual circumstances of the company.**

This may include developments of the type discussed in our [spotlights](#) on Australia, Canada, India, South Africa and the UK. Biodiversity risks may be of higher relevance in jurisdictions where there are robust frameworks of directors' duties,<sup>7</sup> where nature-related disclosure obligations are on the horizon, where there has been significant biodiversity or climate related litigation,<sup>8</sup> or where regulators or national banks are considering biodiversity risks.<sup>9</sup> In industries that are exposed to higher biodiversity risk, consideration of biodiversity may already be part of directors' legal duties, even if liability may not arise soon. Companies in, or linked by value chain, to the agricultural, construction or food sectors may have higher risk exposure.

**Biodiversity risk has already materialised for some companies and is potentially material to many more. Increasing foreseeability and materiality of biodiversity risk across different industries indicates a growing recognition that directors of many companies, in different sectors, will have to consider biodiversity risk in the exercise of their most common statutory and fiduciary duties.** A failure to identify and exploit opportunities presented by the transition to a nature-positive economy is a potential cost to a company that competent directors may not want to ignore. Legal obligations for some companies to disclose material financial risks reinforce the probability that directors of those companies will have duties to govern those risks. Directors that allow the company to misrepresent its position in relation to biodiversity, causing reputational damage, legal risk or costs, may be failing to fulfil their duties.

<sup>7</sup> CCLI, [Across the Globe](#) (last accessed 30 November 2022); Climate Governance Initiative and CCLI, [Primer on Climate Change: Directors' Duties and Disclosure Obligations](#) (July 2022).

<sup>8</sup> See section 3.4, [legal analysis](#)

<sup>9</sup> See section 2.1, [legal analysis](#)

**Decision-useful questions for directors: how biodiversity risks and opportunities might affect corporate governance practices:**

- Do I have the appropriate skills and information about how biodiversity issues could affect my company to discharge my governance and disclosure roles?<sup>10</sup>
- What training or information would help me and my colleagues to build our capacity?
- Is the management team assessing the company's foreseeable biodiversity dependencies and impacts?
- Is the management team measuring the company's material dependencies and impacts on biodiversity and disclosing them in corporate reports? If not, do we have a plan for them to do this?<sup>11</sup>
- Who is responsible in my company for following the development of TNFD and ISSB guidance and building the company's expertise and readiness to implement it?

Please see extended [questions](#) on page 40

<sup>10</sup> The CCLI's corporate governance primer may suggest some questions which boards could ask to help answer this question. CCLI, [The climate risk reporting journey: a corporate governance primer](#) (2018)

<sup>11</sup> See the tools listed at Science Based Targets for Nature (**SBTN**), [Initial Guidance for Business](#) (2020) 25. See also ENCORE, [Exploring Natural Capital Opportunities, Risks and Exposure](#) (last accessed 10 November 2022); Capitals Coalition and Cambridge Conservation Initiative, [Integrating biodiversity into natural capital assessments](#) (2020); [Natural Capital Coalition, Natural Capital Protocol](#) (2016); and Cambridge Institute for Sustainability Leadership Natural Capital Impact Group, [Measuring business impacts on nature: A framework to support better stewardship of biodiversity in global supply chains](#) (2020).





## Introduction

This paper is primarily for company directors, their advisors and those to whom they delegate. It can also inform financial institutions when shaping their expectations of investees and considering their investor fiduciary duties. The paper applies general legal concepts to:

- A) Examine how the risk of biodiversity loss and decline in ecosystem services (together **biodiversity risk**) can present foreseeable and material financial risks and opportunities to individual companies and the wider economic and financial systems.
- B) Demonstrate the social, regulatory and legal context that may influence the obligations of directors and the standard required for performance of directors' duties.
- C) Provide practical examples across key sectors on the foreseeability and materiality of biodiversity risks. Explore the potential financial impacts of biodiversity risk on corporate profits, shareholder value and long-term success of the company.
- D) Outline decision-useful information on how the foreseeability and materiality of biodiversity risks and opportunities might affect directors' duties and corporate governance practices.

The last few years have seen a proliferation of publications and organisations examining biodiversity loss in the corporate and financial context (as referenced throughout this paper). What does this mean for directors' and investors' duties? Over the last six years the CCLI has, through a suite of legal opinions and white papers, examined the relationship between climate and directors' duties.<sup>12</sup> In this time there has been a marked increase in climate litigation and increasing requirements for companies to make climate-related financial disclosures.<sup>13</sup> This prompts questions. Will we see a similar trajectory in relation to biodiversity litigation and disclosure? Will claims be brought against directors? Will companies need to make nature-related financial disclosures aligned with the new disclosure framework?<sup>14</sup> What can directors do to prepare and protect themselves and their companies from legal risks? This paper marks the beginning of the CCLI's biodiversity programme. We will investigate whether similar analysis and conclusions applicable to climate change apply to biodiversity loss. Jurisdiction-specific analysis will follow.

An analysis of similar implications for investors' duties might be the logical next step. The discussion on this is more advanced. Reports by United Nations Principles for Responsible Investment, United Nations Environment Programme Finance Initiative and Freshfields Bruckhaus Deringer comprehensively addressed investor duties. These reports covered i) fiduciary duties in relation to the integration of sustainability issues into investment decision-making and ii) how far investors are legally required or permitted to invest as active agents for sustainability impact. Such active agency may be through investment decisions, stewardship activity and shaping of public policy, where sustainability impact is either an investment objective in itself or integrated within an enterprise not already well aligned with sustainability outcomes.<sup>15</sup> They found that

<sup>12</sup> CCLI, [Across the Globe](#) (last accessed 30 November 2022); Climate Governance Initiative and CCLI, [Primer on Climate Change: Directors' Duties and Disclosure Obligations](#) (July 2022).

<sup>13</sup> "Globally, the cumulative number of climate change-related litigation cases has more than doubled since 2015. Just over 800 cases were filed between 1986 and 2014, and over 1,200 cases have been filed in the last eight years": Joana Setzer and Catherine Higham, Grantham Research Institute on Climate Change and the Environment, [Global trends in climate change litigation: 2022 snapshot](#) (June 2022) 1; [Task Force on Climate-related Financial Disclosures](#) (TCFD) (last accessed 9 November 2022); New Zealand, [Financial Sector \(Climate-related Disclosures and Other Matters\) Amendment Act 2021](#) (2021/39); [New Zealand Ministry for the Environment, Mandatory climate-related disclosures](#) (last updated 22 November 2022, last accessed 28 November 2022); UK Government Website, Press release, [UK to enshrine mandatory climate disclosures for largest companies in law](#) (October 2021); Japanese Financial Services Agency, [The JFSA's Strategy on Sustainable Finance](#) (July 2021-June 2022) (31 August 2021); The Expert Panel on Sustainable Finance, FSA, [The Second Report](#) (July 2022) 12, 14; Government of Canada, [Budget 2022. Tax Measures: Supplementary Information](#) (April 2022); Prime Minister of Canada, [Minister of Environment and Climate Change Mandate Letter](#) (December 2021); Canadian Securities Administrators, [Proposed National Instrument 51-107 Disclosure of Climate-related Matters](#) (October 2021).

<sup>14</sup> [Taskforce on Nature-related Financial Disclosures](#) (last accessed 9 November 2022).

<sup>15</sup> UN PRI and UNEP FI, [Fiduciary Duty in the 21st Century: Final Report](#) (2019); Freshfields Bruckhaus Deringer, [A Legal Framework for Impact: Sustainability impact in investor decision-making](#) (July 2021). These followed a series of similarly themed reports dating from 2005 by these organisations.

fiduciary duty is not a static concept, environmental issues are financially material and that to discharge their fiduciary duties of loyalty and prudence, investors need to consider short- and long-term risks, trends, and innovation. This enables them to identify value-relevant issues, price risk and make asset allocation decisions. The latter report's discussion of impacts as a factor to be considered in parallel to financial goals raises similar questions to this paper's discussion of the materiality of a company's biodiversity impacts (section 4.2, [legal analysis](#)). These reports encompass biodiversity within the larger topic of sustainability. It remains in question whether the complexity of biodiversity loss necessitates a biodiversity specific analysis of investor duties, or if these reports already sufficiently address biodiversity.

This paper seeks to ask questions, rather than provide definitive answers. The paper is broad in scope, and we hope to illustrate the potentially expanding scope of directors' duties in this area. This paper is not a full legal analysis, neither does it seek to present conclusive recommendations. We recognise that the rapidly evolving legal and market context places limitations on this analysis and its application will vary according to jurisdiction and industry context.

We **welcome feedback and collaboration** to explore the questions raised by this paper. Please see the acknowledgements section to submit questions, comments or proposals.

While not every company needs to consider biodiversity risk and opportunity *now*, it is already pertinent to many companies, and may become so for others in the future. Supply chains often conceal companies' interfaces with biodiversity, making biodiversity risks and opportunities not readily apparent. However, since these risks and opportunities could be significant, directors need to be aware of their potential existence. Then they can consider, with due care and diligence, whether they are foreseeable and material, and their associated implications for corporate strategy, oversight of risk management and disclosure. This will depend on jurisdiction, sector and the company's value chain.

**The legal analysis is informed by [Appendix 1](#)** (Biodiversity risk: a material financial risk) **and [Appendix 2](#)** (Case studies: the interface between companies and biodiversity). The analysis is **applicable to many jurisdictions**. Jurisdictional spotlights are examples rather than limits to scope. This is by no means exhaustive and there is ample appetite and scope to explore other jurisdictions in future.

[Appendix 1](#) details how the global economy is dependent on ecosystems, how biodiversity underpins ecosystems, how the loss of such biodiversity poses a systemic and financial risk and how such risks manifest at company level. Figure 7 gives examples of sectors that are dependent on particular ecosystem services. Case studies in [Appendix 2](#) illustrating company interfaces with biodiversity should be of particular use to **signpost business biodiversity resources and examples of how other companies are examining and reporting** on their biodiversity dependencies, impacts, risks and opportunities. This includes:

- Detailed case studies on the [agricultural](#) and [construction](#) industries, two of the largest sectors that are highly dependent on nature.<sup>16</sup> Through these sectors' value chain links to other industries, their dependencies and impacts on biodiversity may be relevant for many companies.
- A [table of brief multi sector examples of company interfaces with nature](#). These illustrate how companies in a variety of sectors may have direct or indirect biodiversity dependencies and impacts.

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<sup>16</sup> World Economic Forum, [Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy](#) (January 2020) 8.

# Legal analysis: Directors' duties and biodiversity loss

## 1 Introduction to the legal analysis

Directors' duties underpin good governance and strategic decision-making, which influence a company's long-term success. An understanding of the applicability of biodiversity risks and opportunities to directors' duties will aid company directors (and their advisors, staff and investors) to participate in an orderly transition towards a nature-positive economy and promote the success of their companies and stakeholders. In this section we examine:

- A) The foundations and key common elements of directors' duties around the world.
- B) Developments in market context relating to biodiversity that may affect interpretation of the standard that directors must meet to discharge those duties.
- C) Whether the law permits or requires boards to govern and disclose:
  - i) biodiversity **risks** arising from their company's dependencies and impacts on ecosystems;
  - ii) biodiversity **impacts** that do not create any quantitatively significant or material risk to the company (but may affect other sectors, companies, society and the environment).
- D) Questions about biodiversity governance for directors to assist in their oversight of biodiversity dependencies, impacts, risks and opportunities, strategy and disclosure.

Most legal frameworks require a level of care, diligence and loyalty of directors, including governance (oversight and strategic planning) and disclosure of foreseeable and material risks to the company. The duties of care and loyalty are often assessed with reference to market, social and regulatory context. For companies that disclose material financial risks the content of the standards of care and loyalty may be more specific. This is because requirements to disclose particular risks may increase the standards of care and loyalty to (at least) include consideration of those risks.

The growing international acknowledgement of biodiversity loss as a systemic and financial risk, combined with market, social regulatory developments all provide a robust context to help understand the changing interpretation of these duties. Such developments include international treaty obligations, disclosure and reporting frameworks, rising investor expectations, an emerging body of biodiversity litigation alongside precedents in climate litigation, standard setting in legislation and recognition of nature within accounting systems, as a financial asset and as a legal person. There is consensus amongst the banking and finance community that environmental risks are not a new category of financial risks, but drivers of existing categories of financial risks.<sup>17</sup>

Evolving disclosure recommendations for companies in relation to biodiversity indicate that directors' duties of care, loyalty and disclosure permit and may even require them to govern the management of biodiversity risks. To discharge these duties, they may have to embed consideration of the company's dependencies, impacts, risks and opportunities into the company's risk management and strategy. In the near or mid-term future this may extend to the company's impacts on biodiversity that do not pose a quantitatively significant or material risk to the company, due to their qualitative materiality.

Research on drivers of biodiversity loss is still evolving, with more data still needed on the interactions between biodiversity, commodities and profitability and the true extent of biodiversity loss (which may be

<sup>17</sup> European Banking Authority, [Discussion paper on the role of environmental risks in the prudential framework](#), (2022) 17; Institute of International Finance, International Swaps and Derivatives Association and Global Financial Markets Association, [IIF/ISDA/GFMA Response to FSB Consultation on Interim Report on Supervisory and Regulatory Approaches to Climate-related Risks](#) (2022) 10; CCLI, [Concerns misplaced: Will compliance with the TCFD recommendations really expose companies and directors to liability risk?](#) (2017) 10.

higher than estimated).<sup>18</sup> There are also barriers to companies' measurement of their biodiversity dependencies and impacts, partly because biodiversity is complex and location-specific.<sup>19</sup> The lack of data in some areas and a proliferation of metrics and measurement approaches with different strengths, purposes and trade-offs also pose barriers. There are over 250 biodiversity-related indicators proposed for monitoring various aspects of the Post-2020 Global Biodiversity Framework and at least 40 different biodiversity measurement tools or frameworks for business use.<sup>20</sup> However, this should not preclude companies from starting to measure biodiversity dependencies and impacts using best available information, even where this involves proxies in the early stages (where necessary, acknowledging that this can sometimes cause inaccuracy and uncertainty), due to the urgent need to address the biodiversity crisis and the rapid development of improved policies, methods, and tools.<sup>21</sup>

The section concludes by looking at questions that well informed directors can ask in light of the potential reinterpretation of their duties to include governance and disclosure of biodiversity.

Following this section we spotlight the duties and developments relevant in Australia, Canada, India, South Africa and the UK. These are non-exhaustive and illustrative examples of specific context that may be applicable to directors' evaluation of the questions posed. However, this does not limit the application of this paper to those jurisdictions. The paper's analysis may be particularly relevant to jurisdictions covered by CCLI's legal opinions, primers and white papers on climate change risk.<sup>22</sup> As noted in this paper, jurisdictions such as Malaysia, France, Brazil and the Netherlands have given importance to consideration of biodiversity risks. Other factors applicable in a jurisdiction might include evolving legal frameworks of directors' and fiduciary duties, case law, regulatory and market developments, the quantity and quality of biodiversity present and rate of biodiversity loss there. Please see the [acknowledgements](#) for details on how to contribute with ideas on jurisdictional application.

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<sup>18</sup> Cambridge Institute for Sustainability Leadership, [There is a lack of data demonstrating the links between biodiversity and certain commodities](#); Global Canopy, [Data is the key in the fight against biodiversity loss](#) (2021); Jan Borgelt et al. [More than half of data deficient species predicted to be threatened by extinction](#) (2022) 5(679) Communications Biology.

<sup>19</sup> Joseph W. Bull et al., Nature, [Analysis: the biodiversity footprint of the University of Oxford](#) (2022).

<sup>20</sup> Sophus zu Ermgassen et al., [Are Corporate Biodiversity Commitments Consistent with Delivering 'nature-positive' Outcomes? A Review of 'nature-positive' Definitions, Company Progress and Challenges](#) (July 2022) 14; Convention on Biological Diversity, [Proposed headline indicators of the monitoring framework for the post-2020 global biodiversity framework](#) (2021); European Commission, [Assessment of Biodiversity Measurement Approaches for Business and Financial Institutions](#) (2021).

<sup>21</sup> "Biodiversity loss is complex, but data limitations are no excuse for inaction" De Nederlandsche Bank, [Three takeaways from our biodiversity conference](#) (2022); Cambridge Institute for Sustainability Leadership (CISL), [Developing a Corporate Biodiversity Strategy](#) (2020); Principles for Responsible Investing, [Investor Action On Biodiversity: Discussion Paper](#) (2020); Nature Metrics, [Simple metrics based on complex data sets: our vision for post-2020 science-based targets for nature](#) (2022); BID-REX, [Better data, better decisions: increasing the impact of biodiversity information](#) (2019).

<sup>22</sup> CCLI, [Across the Globe](#) (last accessed 30 November 2022); Climate Governance Initiative and CCLI, [Primer on Climate Change: Directors' Duties and Disclosure Obligations](#) (July 2022).

## 2 Common duties of directors

In general, around the world, either in statute or in judge-made law, directors have a fiduciary relationship to their company. They owe two core duties when discharging their functions (phrased differently in each jurisdiction):<sup>23</sup>

- A) the duty to promote the success of the company (also described as the duty of loyalty); and
- B) the duty of care (variously described as skill, diligence and competence).<sup>24</sup>

These duties commonly import obligations in relation to directors' functions such as:

- 1) strategic direction and planning;
- 2) overseeing the management of foreseeable and material risks (i.e. both existing and emerging/potential risks); and
- 3) signing off on disclosure (of material risks to financial prospects and material impacts on financial performance and position) and attesting to financial statements and annual reports.

### 2.1 Relevance of biodiversity risk and opportunity to directors' duties

As detailed in [Appendix 1](#) and exemplified in the case studies in [Appendix 2](#), in light of emerging science and financial quantification, biodiversity risk has already materialised for some companies, and is potentially material to many more.<sup>25</sup> Studies undertaken by central banks in the Netherlands, Malaysia, France and Brazil have found their national financial sectors to have high levels of exposure to companies that are highly or very highly dependent on one or more ecosystem services.<sup>26</sup> Much of this exposure is in sectors that also strongly impact ecosystem services.<sup>27</sup> This may mean exposure to a higher level of transition risk from future regulations and policies designed to protect ecosystems, if current business models do not align with, or make it harder to adapt to, such regulations and policies.<sup>28</sup> Nearly 80% of the portfolios of French financial institutions were at least "moderately" dependent on at least one ecosystem service.<sup>29</sup> BNP Paribas Asset Management found that its investments "*potentially maintain a fully degraded area equivalent to five times the size of London each year.*"<sup>30</sup> These findings suggest that many individual companies are likely to have existing dependency and impact exposure to biodiversity risks (that can be turned to opportunities).

Systemic and economy-wide biodiversity risk (as detailed in [Appendix 1](#)) may be relevant to a company, depending on its business. For example, banks and insurers may be at risk if macroeconomic impacts arise

<sup>23</sup> Climate Governance Initiative and CCLI, [Primer on Climate Change: Directors' Duties and Disclosure Obligations](#) (July 2022).

<sup>24</sup> This duty is not always fiduciary in nature.

<sup>25</sup> Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), [Global Assessment Report on Biodiversity and Ecosystem Services](#) (2019); IPBES-IPCC, [Scientific Outcome of the IPBES-IPCC co-sponsored workshop on biodiversity and climate change](#) (June 2021).

<sup>26</sup> 36 percent of the portfolio of Dutch financial institutions examined; 54 percent of the Malaysian banks' commercial lending portfolio; 42 percent of the market value of securities held by French financial institutions; 46 percent of Brazilian banks' non-financial corporate loan portfolio.

<sup>27</sup> The biodiversity footprint of Dutch financial institutions, through the companies financed, is comparable with the loss of over 58,000 km<sup>2</sup> of pristine nature. About 87 percent of Malaysian banks' commercial lending portfolio could currently be exposed to sectors that strongly impact ecosystem services, thus facing a higher level of transition risk. The accumulated terrestrial biodiversity footprint of securities held by French financial institutions is comparable to the loss of at least 130,000 km<sup>2</sup> of "pristine" nature, which corresponds to the complete artificialization of 24% of the area of metropolitan France. 15 percent of Brazilian banks' corporate loan portfolio is to firms potentially operating in protected areas, which could increase to 25 percent should conservation gaps close, and 38 percent should all priority areas become protected.

<sup>28</sup> De Nederlandsche Bank, [Indebted to nature – Exploring biodiversity risks for the Dutch financial sector](#) (2020); Bank of Malaysia and the World Bank, [An Exploration of Nature-Related Financial Risks in Malaysia](#) (2022); Banque de France, [A "Silent Spring" for the Financial System? Exploring Biodiversity-Related Financial Risks in France](#) (2021); Pietro Calice, Federico Diaz Kalan, and Faruk Miguel, [Nature-Related Financial Risks in Brazil](#) (2021).

<sup>29</sup> Banque de France, [A "Silent Spring" for the Financial System? Exploring Biodiversity-Related Financial Risks in France](#) (2021).

<sup>30</sup> BNP Paribas Asset Management, [BNP Paribas Asset Management publishes first biodiversity footprint of investments](#) (4 July 2022).

from a disorderly shift or financial contagion, leading to an increase in capital regulatory pressures, credit risk rating reviews or insurance tightening for specific sectors, activities or geographies.<sup>31</sup> Systemic and economy-wide risks may assist directors of other companies as a starting point to assess specific environmental risks to the company. According to the Principles of Responsible Investment (a United Nations-supported international network of financial institutions, representing over US\$120 trillion in collective assets under management),<sup>32</sup> environmental factors, which include biodiversity, can be material to a company's entire business and must be considered appropriately by boards.<sup>33</sup> The world's largest proxy advisors have indicated that the risk of insufficient oversight, improper management or inadequate disclosure of material environmental issues could harm shareholder interests and constitute grounds to recommend voting against the relevant board members.<sup>34</sup>

Increasing foreseeability and materiality of biodiversity risk across different industries indicates a growing recognition that directors of many companies, in different sectors, will have to consider biodiversity risk in the exercise of their most common statutory and fiduciary duties. Furthermore, a failure to identify and exploit opportunities presented by responsible management of biodiversity risks (as described in [Appendix 1](#)) is a potential cost to a company that competent directors may not want to ignore.<sup>35</sup> Directors that allow the company to misrepresent its position in relation to biodiversity, causing reputational damage, legal risk or costs, may be failing to fulfil their duties.<sup>36</sup>

Generally, there are regulations requiring listed companies to disclose material financial risks. In some jurisdictions these requirements apply only to public companies, in others they are extended to large private companies. The existence of such legal obligations reinforces the likelihood that there are duties of care and loyalty for directors of those companies to govern material biodiversity risks.<sup>37</sup>

## 2.2 *The duty of loyalty/ duty to promote the success of the company*

The duty of loyalty is commonly a requirement to act in good faith in the best interests of the company. In some countries this can include directors being required to consider the environment. For example, in the UK (see [Spotlight: United Kingdom](#)), directors are required to have regard to a non-exhaustive list of factors in discharging their obligation to promote the success of the company; in India, directors are required to act in the best interests of stakeholders, including the environment, on an equal hierarchy to the interests of the company (see [Spotlight: India](#)).<sup>38</sup> It is possible that the duty of loyalty could be breached by a director who failed to act in good faith in considering biodiversity risks and opportunities. This could include:

<sup>31</sup> CCLI, [The emergence of foreseeable biodiversity-related liability risks for financial institutions](#) (2019) 17.

<sup>32</sup> Principles for Responsible Investment, [2021-22 Annual Report](#) (2022) 2, 35,36.

<sup>33</sup> Fiona Reynolds, Principles for Responsible Investment Blog, [ESG and climate change: time for corporate boards to step up their game](#) (2020).

<sup>34</sup> Glass Lewis, [2022 Policy Guidelines](#) (2022) 26, 27, 31; Institutional Shareholder Services, [Sustainability Proxy Voting Guidelines 2022 Policy Recommendations](#) (2022).

<sup>35</sup> OECD, [Biodiversity: Finance and the Economic and Business Case for Action](#) (2019) 35; [Business for Nature, COP15 Business Statement for Mandatory Assessment and Disclosure - FAQ](#) (2022).

<sup>36</sup> ASA, Advertising Guidance - misleading environmental claims and social responsibility (6 June 2022); Investment Week [HSBC set to be accused of greenwashing by Advertising Standards Authority - reports](#) (29 April 2022); ASA, [Ruling on Oatly UK Ltd t/a Oatly](#) (January 2022); Walker Morris, [The crackdown on greenwashing continues: ASA's ruling that Tesco's advert regarding plant-based burger was misleading](#) (9 June 2022); ASA, [ASA Ruling on Shell UK Ltd](#) (July 2020); ASA, [ASA Ruling on Ryanair Ltd t/a Ryanair Ltd](#) (February 2020); ASA, [ASA Ruling on Hyundai Motor UK Ltd](#) (June 2021).

<sup>37</sup> Climate Governance Initiative and CCLI, [Primer on Climate Change: Directors' Duties and Disclosure Obligations](#) (July 2022).

<sup>38</sup> For UK: Section 172(1)(d) of the UK Companies Act; Andrew Keay and Taskin Iqbal, [The Impact of Enlightened Shareholder Value](#) (2019) 4, 5; *Cobden Investments Ltd v RWM Langport Ltd* [2008] EWHC 2810 (Ch); *Re West Coast Capital (LIOS) Ltd* [2008] CSOH 72, 2008 Scot (D) 16/5. See Department of Business, Energy and Industrial Strategy, [Corporate Governance Reform](#) (November 2016); Company Law Review Steering Group, *Modern Company Law for a Competitive Economy: Strategic Framework* (1999) London, Department of Trade and Industry, para 5.1.12. For India: Section 166(2) of the Indian Companies Act; *M.K. Ranjitsinh v. Union of India* (2021) SCC Online SC 326; Mihir Naniwadekar and Umakanth Varottil, *The Stakeholder Approach Towards Directors' Duties Under Indian Company Law: A Comparative Analysis in Mahendra Pal Singh (ed.), The Indian Yearbook of Comparative Law* (Oxford University Press, 2016).

- A) failing to consider in good faith, or wilfully disregarding a material biodiversity risk in strategic decision-making (e.g. project approvals or acquisitions) where that risk was evident. Bad faith or wilful disregard might occur in pursuance of directors' financial interests, political beliefs or affiliations. Alternatively, where no reasonable director could have rationally concluded that a course (or lack) of action was in the best interests of the company;
- B) failing to adequately embed biodiversity risk into risk management processes (e.g. by failing to properly embed consideration of dependencies and impacts, scenario testing or procurement of expert advice relating to particular biodiversity risks). Alternatively, having implemented such a system, consciously failing to monitor its operations, resulting in a failure to stay informed of risks or problems;
- C) failing to consider opportunities for the company to adapt in a timely manner to the transition to a 'nature-positive' economy, including opportunities to create value from biodiversity or new business models; or
- D) failing to act in accordance with their assessment of risk, if that decision was one which no reasonable director could have made<sup>39,40</sup>

### 2.3 The duty of care and diligence/ skill and competence

The duty of care and diligence is particularly relevant to identifying and governing management of biodiversity risks and opportunities. In many jurisdictions the standard applied to directors' duty of care is that of a reasonable person in comparable circumstances and often involves making informed decisions after reasonable enquiry.<sup>41</sup> This can, depending on jurisdiction, include a subjective element (the actual knowledge, skills and experience of the director) and/or an objective element (the standard that would be exercised by a reasonably diligent person with the skill, knowledge and experience reasonably expected of a person in their position).<sup>42</sup>

It is possible that a director could breach the duty of care and diligence by failing to:

- A) consider and govern for foreseeable and material biodiversity risks (even where such failure is in good faith). This could occur either in general strategy and oversight, or in the approval of specific projects or acquisitions. It could include total failure, or partial failure, where the consideration or governance is only superficial;
- B) consider relevant information in relation to material physical and transition biodiversity risks, especially where the company operates in a high-risk sector. This could include failing to make reasonable enquiries, seek appropriate independent advice or procure information on 'soft law' instruments such as disclosure and reporting standards;

<sup>39</sup> See for example, cases against ExxonMobil for deceptive practices in relation to management of climate risk: Climate Case Chart, [Commonwealth v. Exxon Mobil Corp.](#) (2019) (last accessed 9 November 2022).

<sup>40</sup> See CCLI, [Fiduciary Duties and Climate Change in The United States](#) (2021); CCLI, [Directors' Liability and Climate Risk: United Kingdom - Country Paper](#) (2018) 14-18; CCLI, [Directors' Liability and Climate Risk: Canada - Country Paper](#) (2018) 10; CCLI, [Directors' Liability and Climate Risk: Australia - Country Paper](#) (2018) 10-11.

<sup>41</sup> See for example Canada (Section 122(1) of the Canada Business Corporations Act, note 24; *Peoples Department Stores Inc (Trustee of) v Wise*, 2004 SCC 68, [2004] 3 SCR 461; *BCE Inc v 1976 Debentureholders*, 2008 SCC 69, [2008] 3 SCR 560, paragraph 39; Janis Sarra, Canada Climate Law Initiative [Fiduciary Obligations in Business and Investment: Implications of Climate Change](#) (April 2018); US (Sarah Barker, Cynthia Williams and Alex Cooper, CCLI, [Fiduciary Duties And Climate Change In The United States](#) (2021); UK (Section 174(2)(a) of the UK Companies Act; *Re Barings plc* (No 5) [1999] 1 BCLC 433); South Africa (Section 76(3)(c) and 76(4) of the South African Companies Act; Christine Reddell, CCLI, [Directors' Liability and Climate Risk: South Africa - Country Paper](#) (April 2018)); Australia (Section 180 of the Corporations Act 2001 (Cth); Brett Walker, Gerald Ng, Australian Institute Of Company Directors, [The Content Of Directors' "Best Interest" Duty - Memorandum Of Advice](#) (2022)); India (Section 166(3) of the Indian Companies Act); and, in general, CCLI, [Primer on Climate Change: Directors' Duties and Disclosure Obligations](#) (July 2022).

<sup>42</sup> CCLI, [Directors' Liability and Climate Risk: Comparative Paper](#) (2019); CCLI, [Primer on Climate Change: Directors' Duties and Disclosure Obligations](#) (July 2022).



- C) adequately embed biodiversity risk into risk management processes. For example by failing to properly embed consideration of dependencies and impacts, scenario testing or seek expert advice relating to particular biodiversity risks;
- D) critically evaluate or obtain independent review of advice and information in relation to biodiversity risk; or
- E) prevent the company from making misleading disclosures in relation to biodiversity dependencies, impacts, risks or opportunities, as relevant.<sup>43</sup>

## 2.4 Implications for directors

There is not yet sufficient case law on companies' and directors' responsibility for biodiversity loss to be able to assess the possibility of directors' liability for breaching their duties. While market context and evolving best practice (see below) suggests that the law permits or requires directors to contemplate biodiversity risks and opportunities in fulfilling their duties, failure may not often lead to liability. In certain jurisdictions there may not be sufficient evidence to prove liability. In others there may be difficulties for potential claimants to meet the bar to establish a claim. It is common for the business judgement rule to afford directors a degree of autonomy in how they fulfil their duties. It is still relatively rare for directors to be found liable for breaches of their duties of care and loyalty.<sup>44</sup> However, an increasing number of cases against companies and some incipient cases against directors in relation to climate change suggest that there will potentially be similar cases in relation to biodiversity loss.<sup>45</sup> There has been at least one climate-related derivative action by shareholders (on behalf of the company) on the grounds of the board's failure to put in place adequate control and monitoring systems.<sup>46</sup> Investors in a US company brought a class action against directors on the grounds that the value of securities was misrepresented through misleading statements on the sustainability of the company's procurement. The company was alleged to be dependent on deforestation and negatively impacting biodiversity. While this case relates to securities law rather than directors' duties, it indicates an appetite of litigants for biodiversity-related claims, including against directors.<sup>47</sup> For further discussion of litigation see section 3.4 below.

While the risk of claims against directors may not currently be high, the risk of liability should not be the sole reason for directors to meet their duties (see Figure 1). Avoiding liability is a minimum bar. Prudent good governance and best practice require directors to exercise a higher level of care and loyalty. Directors are likely to have personal pride and gratification in exercising their role successfully, with a general desire for the company to succeed and to be perceived as ethical by stakeholders. Directors' can be motivated to avoid reputational risk (to directors and the company), the cost of defending claims (even those unlikely to succeed) and other legal risks to the company (such as fines or regulatory action).

<sup>43</sup> See CCLI, [Fiduciary Duties and Climate Change in The United States](#) (2021); CCLI, [Directors' Liability and Climate Risk: Comparative Paper – Australia, Canada, South Africa, and the United Kingdom](#) (2019).

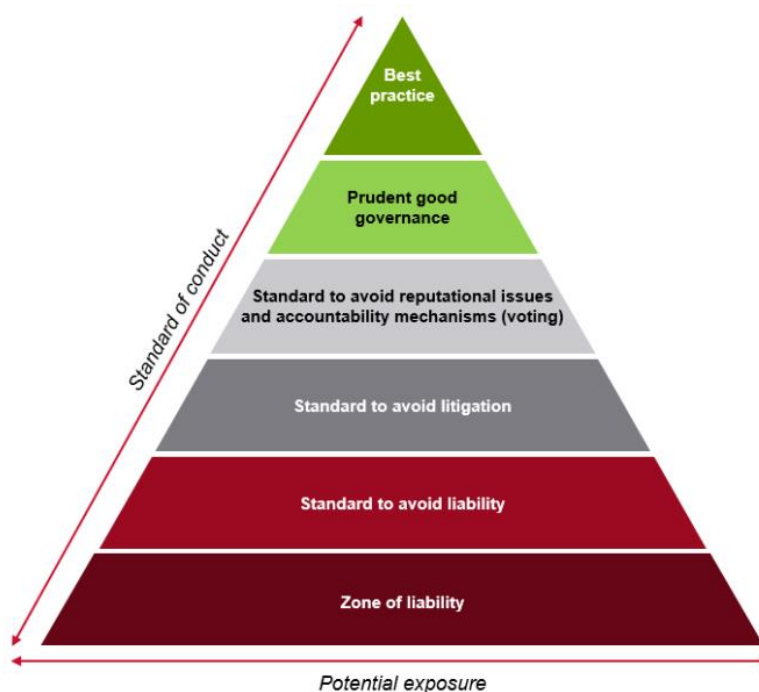
<sup>44</sup> For further discussion in the context of climate, see CCLI, [Fiduciary Duties and Climate Change in The United States](#) (2021); CCLI, [Directors' Liability and Climate Risk: Comparative Paper](#) (2019); CCLI, [Primer on Climate Change: Directors' Duties and Disclosure Obligations](#) (July 2022).

<sup>45</sup> "Globally, the cumulative number of climate change-related litigation cases has more than doubled since 2015. Just over 800 cases were filed between 1986 and 2014, and over 1,200 cases have been filed in the last eight years": Joana Setzer and Catherine Higham, Grantham Research Institute on Climate Change and the Environment, [Global trends in climate change litigation: 2022 snapshot](#) (June 2022) 1.

<sup>46</sup> The case against Shell's directors in relation to climate risk: ClientEarth, Press Release, [ClientEarth starts legal action against Shell's Board over mismanagement of climate risk](#) (March 2022); ClientEarth, [Redirecting Shell](#) (2022); ClientEarth, ClientEarth shareholder litigation against Shell's Board FAQ (March 2022).

<sup>47</sup> [Fagen v Enviva Inc.](#), No. 22-cv-02844 (D. Md. 2022).

**Figure 1: Hierarchy of personal exposure for directors on biodiversity issues**



Source: CCLI <sup>48</sup>

## 2.5 Interpretation of duties

The factual context to directors' decisions will be a relevant factor in assessing the reasonableness of those decisions. The law usually interprets the standard of reasonable conduct in relation to the duties of care and loyalty with reference to market, social and regulatory standards.

*"The changing environment in which they operate also has a significant impact upon what the law expects of directors in practice...An assessment of the practical implications of those duties has to take account of the general environment of expectation created by initiatives by regulators and in civil society."<sup>49</sup>*

This means that the scope and interpretation of directors' duties can develop without legislative amendments. The definition of a reasonable decision or course of conduct for prudent oversight of risk management and good governance will keep pace with rapidly evolving external circumstances.<sup>50</sup> The evolution of directors' duties will also depend heavily on jurisdiction and company circumstances. This paper spotlights five jurisdictions that show the importance of the jurisdictional context, to aid this evaluation. These examples can also indicate the type of similar circumstances that may be relevant in other jurisdictions around the world.

<sup>48</sup> CCLI, [Fiduciary Duties and Climate Change in The United States](#) (2021) 46.

<sup>49</sup> Lord Sales, Justice of the Supreme Court, Anglo-Australasian Law Society, Sydney, [Directors' duties and climate change: Keeping pace with environmental challenges](#) (2019) 10.

<sup>50</sup> CCLI, [Primer on Climate Change: Directors' Duties and Disclosure Obligations](#) (July 2022).

### 3 *Evolving developments indicate rising standards of care and loyalty*

The following market, social and regulatory developments may influence the success of the company and the diligence required by directors to promote such success. They may therefore heighten the standards of care and loyalty that directors must apply to biodiversity risks and opportunities. The interpretation of these standards will continue to evolve at pace with market, social and regulatory developments.

#### 3.1 *Rising standards: Market signals from governments committing to global biodiversity targets*

**COP15 and subsequent developments.** At the fifteenth conference of the parties to the UN Convention on Biological Diversity in December 2022 (**COP15**), governments are expected to adopt global biodiversity targets in the Post-2020 Global Biodiversity Framework.<sup>51</sup> To implement these targets, state parties to the Convention on Biological Diversity will be required to submit National Biodiversity Strategy and Action Plans.<sup>52</sup> Legal frameworks play a fundamental role in the implementation of such plans by, among other things, setting a legal basis for biodiversity policies and planning across the various sectors and levels of national governments.<sup>53</sup>

**What does this mean for companies and their boards?** If, as anticipated, these targets gain similar recognition and momentum as the climate targets laid out in the Paris Agreement, they may begin to influence social expectations of companies which in turn could impact the standards expected from companies over time even ahead of national implementing legislation.<sup>54</sup> Global biodiversity targets are likely to affect multinationals and global supply chains. In particular, Target 15 of the draft Post-2020 Global Biodiversity Framework (as drafted and likely adopted) includes a form of commitment from governments to require or support businesses in the assessment and reporting of their biodiversity dependencies and impacts, reducing their negative impacts and overall biodiversity risks, while increasing positive impacts.<sup>55</sup> The Paris Agreement, by comparison, did not have such an explicit focus on the role of corporate actors in achieving its climate goals. The inclusion of Target 15 may be a tipping point in addressing corporate contribution to and responsibility for biodiversity loss. Adoption of the Post-2020 Global Biodiversity Framework with explicit targets for corporations<sup>56</sup> will create a regulatory transition risk in every state party to the Convention on Biological Diversity. Directors will have to consider such a risk in their governance and decision-making process. Even if the Post-2020 Global Biodiversity Framework lacks explicit targets it may change social perceptions of biodiversity risk that, over time, influence the standards of care and loyalty expected of directors.

#### 3.2 *Rising standards: Emerging disclosure standards (narrative reporting and financial statement integration)*

**Task Force on Nature-related Financial Disclosures requirements.** Since 2021 the Task Force on Nature-related Financial Disclosures<sup>57</sup> (**TNFD**) (endorsed and funded by governments, the UN, and philanthropic foundations<sup>58</sup>) has released several beta versions of disclosure recommendations relating to biodiversity

<sup>51</sup> [UN Biodiversity Conference COP15](#)

<sup>52</sup> Convention on Biological Diversity, [National Biodiversity Strategies and Action Plans \(NBSAPs\)](#) (last accessed: 9 November 2022).

<sup>53</sup> United Nations Environment, [Law and National Biodiversity Strategies and Action Plans](#) (2018).

<sup>54</sup> Noting that in some jurisdictions national implementing legislation is not necessary in order to become national law.

<sup>55</sup> Convention on Biological Diversity, Open-Ended Working Group On The Post-2020 Global Biodiversity Framework, Fourth Meeting, Nairobi, [Recommendation Adopted By The Working Group On The Post-2020 Global Biodiversity Framework](#) (June 2022) 20

<sup>56</sup> Targets 14, 15, 18 and 19 are explicitly addressed to corporations and financial actors.

<sup>57</sup> [Taskforce on Nature-related Financial Disclosures](#) (last accessed 9 November 2022).

<sup>58</sup> Taskforce on Nature-related Financial Disclosures, [G7 backs new Taskforce on Nature-related Financial Disclosures](#) (June 2021); TNFD, [About - Who we are](#) (last accessed 9 November 2022); TNFD, [The TNFD Forum](#) (last accessed 9 November 2022).

dependencies, impacts, risks and opportunities. It is highly anticipated that the TNFD will follow the path of the Task Force on Climate-related Financial Disclosures (TCFD),<sup>59</sup> with governments (for example New Zealand, the UK (see [Spotlight: United Kingdom](#)), Japan and Canada (see [Spotlight: Canada](#)) having announced or implemented mandatory climate disclosures for certain companies aligned with TCFD guidance.<sup>60</sup>

French financial institutions are already obliged by law to disclose biodiversity risks and impacts.<sup>61</sup> The Executive Secretary of the Convention on Biological Diversity and co-chair of the TNFD Elizabeth Mrema has indicated that, depending on the text adopted for Target 15 of the Post-2020 Global Biodiversity Framework, TNFD reporting could become mandatory for many companies in signatory jurisdictions.<sup>62</sup> As mentioned above, the latest iteration of draft Target 15 to be negotiated at COP15 includes a commitment for states to take measures applicable to companies. This may involve some or all companies monitoring, assessing, and fully and transparently disclosing their impacts on biodiversity. The target may extend to include dependencies on biodiversity and entire value chain analysis.<sup>63</sup> A legislative requirement for a company to disclose material biodiversity risks and impacts is likely to inform the content of the director's duties of care and loyalty. This would require the company's consideration of those risks and impacts.

**What does this mean for companies and their boards?** Ahead of any legislative obligations to disclose, it is likely that investors will increasingly view TNFD-aligned disclosures as best practice. Investors may impose TNFD-aligned disclosure as a contractual requirement. Lack or insufficiency of disclosure would in that case entail a breach of contract rather than violation of directors' duties. Such explicit attention to biodiversity risks and impacts by investors may have a bearing on the level of care and loyalty required of the investee company's directors in governing those risks and impacts. It is also possible that in the absence of legislative and investor pressures, companies may have their standards of care and loyalty raised through the practices of other companies in their same sector that already face such pressures.

**International Sustainability Standards Board developments.** The International Financial Reporting Standards Foundation (IFRS) established the International Sustainability Standards Board (ISSB) in response to investor demand for high quality sustainability reporting. The ISSB is developing a comprehensive global baseline of investor-focused sustainability disclosures. The first version of these standards has been published in the Exposure Draft on General Sustainability-related Disclosures (the **ISSB Exposure Draft**).<sup>64</sup> The ISSB Exposure Draft recommends supplemental non-mandatory biodiversity-related disclosures<sup>65</sup> and is expected to form part of legislative reporting standards in some countries, for example the UK (see [Spotlight: United Kingdom](#)).<sup>66</sup> While the biodiversity-related disclosures are currently non-mandatory and supplementary, the ISSB Exposure Draft can be seen as a starting point which may lead to global significant

<sup>59</sup> [Task Force on Climate-related Financial Disclosures](#) (TCFD) (last accessed 9 November 2022)

<sup>60</sup> New Zealand, [Financial Sector \(Climate-related Disclosures and Other Matters\) Amendment Act 2021](#) (2021/39); [New Zealand Ministry for the Environment, Mandatory climate-related disclosures](#) (last updated 22 November 2022, last accessed 28 November 2022); UK Government Website, Press release, [UK to enshrine mandatory climate disclosures for largest companies in law](#) (October 2021); Japanese Financial Services Agency, [The JFSA's Strategy on Sustainable Finance](#) (July 2021-June 2022) (31 August 2021); The Expert Panel on Sustainable Finance, FSA, [The Second Report](#) (July 2022) 12, 14; Government of Canada, [Budget 2022. Tax Measures: Supplementary Information](#) (April 2022); Prime Minister of Canada, [Minister of Environment and Climate Change Mandate Letter](#) (December 2021); Canadian Securities Administrators, [Proposed National Instrument 51-107 Disclosure of Climate-related Matters](#) (October 2021).

<sup>61</sup> Article 29 of the French law on Energy and Climate; Global Canopy, [France's Article 29: biodiversity disclosure requirements sign of what's to come](#) (2021); Green Finance Platform, [France's Law on Energy and Climate Adds Coverage of Biodiversity, Ecosystems, and Renewable Energy to Investors' Non-Financial Reporting](#) (2021).

<sup>62</sup> Environmental Finance, Mrema, [TNFD reporting could become mandatory at COP15](#) (July 2022), Responsible Investor, [Make TNFD reporting mandatory says head of UN biodiversity convention](#) (July 2022).

<sup>63</sup> Open-Ended Working Group on the Post-2020 Global Biodiversity Framework, Nairobi, [Draft recommendation submitted by the Co-Chairs](#) (June 2022) 13.

<sup>64</sup> International Sustainability Standards Board, [Exposure Draft: General Requirements for Disclosure of Sustainability-related Financial Information](#) (2022).

<sup>65</sup> IFRS Foundation, [ISSB delivers proposals that create comprehensive global baseline of sustainability disclosures](#) (March 2022); IFRS Sustainability - ISSB, [Exposure Draft on IFRS Sustainability Disclosure Standard](#) (March 2022); Climate Disclosure Standards Board, [CDSB Framework - Application Guidance for biodiversity-related disclosures](#) (November 2021).

<sup>66</sup> UK Financial Conduct Authority, [Sustainability Disclosure Requirements \(SDR\) and investment labels](#) (2021).

developments in a short time horizon. The ISSB's integration of all sustainability risks may have significant effects on the speed of national adoption of biodiversity risk disclosures. Developed frameworks, such as climate risk disclosures, could provide pathways for other sustainability matters.

**What does this mean for companies and their boards?** A company that is reporting in accordance with the ISSB framework may see a rise in the standards of care and loyalty that its directors are expected to consider while governing the type of risks and opportunities they report on. This may occur because a) through supporting the reporting framework, investors have indicated that this type of risk and opportunity is relevant to them, and b) by becoming aware of the risks and opportunities through reporting, it logically follows that a diligent board will govern and oversee management of such risks and opportunities in order to fulfil their duties of care and loyalty. There is also a possibility that the ISSB framework could raise the general standards of care and loyalty for directors of companies in jurisdictions or sectors where their peers are reporting. I.e. by elevating global practice and broadening the scope of what is considered 'reasonable' for a director in similar positions.

**International Accounting Standards Board developments.** The sustainability disclosure and reporting recommendations described above are forward-looking, whereas financial statements generally focus on historical performance. However, environmental risks may affect the assumptions underlying estimates in financial statements, which could make them relevant to financial reporting and thus directors' duties.

The International Accounting Standards Board (IASB)<sup>67</sup> has indicated that emerging environmental risks may require disclosure in the financial statements and/or management commentary.<sup>68</sup> It states that qualitative external factors may make some risks sufficiently 'material' to warrant disclosure in financial statements. Such risks are described as climate-related risks and other emerging risks, which could apply to biodiversity risks. Financial disclosure will depend on a materiality judgement exercised by the company as to i) whether investors could reasonably expect that emerging risks could affect the amounts reported in the financial statements; ii) whether investors have indicated the importance of information about such risks to their decision-making; and iii) what information about the effect of emerging risks is material to the assumptions made in preparing the financial statements. The IFRS Accounting Standards deem information to be material if "omitting, misstating or obscuring it could reasonably be expected to influence decisions that the primary users of general-purpose financial statements make on the basis of those financial statements, which provide financial information about a reporting entity."<sup>69</sup>

The Australian Accounting Standards Board issued similar guidance that inspired the IASB's indications.<sup>70</sup> In Australia, lawyers indicated that ANZ Bank might be the potential target of a forthcoming legal claim on the grounds that its directors' report does not disclose the financial materiality of biodiversity loss, as required by the Corporations Act.<sup>71</sup> Another Australian bank, Westpac, already disclosed nature-related risks and opportunities in the strategic review and group performance sections of its annual report (but not in the notes to its financial statements, which mention solely consideration of climate risk.)<sup>72</sup>

The IASB's updated exposure draft on management commentary to the financial statements advises that such commentary should provide information on factors that could affect the entity's ability to create value and generate cash flows across all time horizons. This includes in relation to business model, resources, risks and external environment. For example, information on the environmental impacts of the company that

<sup>67</sup> The IASB, part of the IFRS, sets the global benchmark the IFRS Accounting Standards: IASB, [About the International Accounting Standards Board \(IASB\)](#) (last accessed 7 December 2022)

<sup>68</sup> Nick Anderson, [IFRS Standards and climate-related disclosures](#) (2019); IFRS, [Effects of climate-related matters on financial statements](#) (2020); IFRS, [IFRS Practice Statement Exposure Draft ED/2021/6: Management Commentary](#) (2021)

<sup>69</sup> Nick Anderson, [IFRS Standards and climate-related disclosures](#) (2019).

<sup>70</sup> AASB, [Climate-related and other emerging risks disclosures: assessing financial statement materiality using AASB/IASB Practice Statement 2](#) (2019)

<sup>71</sup> Financial Review, [ANZ under pressure to reveal biodiversity risk](#) (29 August 2022).

<sup>72</sup> Westpac Banking Corporation, [Annual Report](#) (2022)

could affect its future value creation, the extent of the company's dependency on and rate of consumption of natural resources and the effects or potential effects of factors and trends in the natural environment.<sup>73</sup> This guidance is non-binding. The updated draft has not been finalised, since the launch of the ISSB may affect the role of management commentary. There are various possible places in general purpose financial reports in which sustainability-related financial disclosures could be included. The IASB is currently evaluating the evolving reporting landscape and integrated reporting framework to support connectivity between financial statements and sustainability-related financial disclosures.<sup>74</sup>

**What does this mean for companies and their boards?** Companies will need to carefully consider the definition of materiality provided by the IASB and closely follow IASB updates to determine whether biodiversity risks and opportunities are material for the purposes of their financial statements or management commentary. If they are, this will potentially have implications on the materiality of biodiversity risks for directors' governance purposes. Directors signing off on financial disclosures would therefore be prudent to ensure that there are procedures in place to identify materially important biodiversity risks.

### 3.3 *Rising standards: Elevated investor expectations*

**Growing focus on biodiversity loss.** Investor pledges, frameworks and benchmarks such as the Network for Greening the Financial System (a group of central banks and financial supervisors),<sup>75</sup> the Finance for Biodiversity Pledge (representing €14.7 trillion in assets),<sup>76</sup> Nature Action 100+,<sup>77</sup> the Principles for Responsible Investment (a network of over 3,000 institutional investors that has indicated biodiversity as a priority)<sup>78</sup> and Principles for Responsible Banking<sup>79</sup> indicate growing appetite by the world's biggest investors to manage biodiversity risk.<sup>80</sup> The National Capital Finance Alliance guides financial institutions to assess their natural capital risk and exposure.<sup>81</sup>

**What does this mean for companies and their boards?** As investors' recognition of biodiversity risk grows, investee companies may wish to prepare for biodiversity-related queries and requests to set Science-Based Targets for nature.<sup>82</sup> An investor's request for biodiversity-related disclosure and risk management signals to directors that the investor(s) deem biodiversity a material risk or opportunity to the company that directors need to govern and disclose.

**Investor engagement on broader governance issues.** In addition to investor expectations around biodiversity risk governance and disclosure, directors may want to be prepared for questions around their lobbying and trade association relationships in relation to biodiversity, i.e., any activities or advocacy that directly or indirectly influence biodiversity-significant policy decision-making by political or bureaucratic

<sup>73</sup> Nick Anderson, [IFRS Standards and climate-related disclosures](#) (2019); IFRS, [Effects of climate-related matters on financial statements](#) (2020); IFRS, [IFRS Practice Statement Exposure Draft ED/2021/6: Management Commentary](#) (2021) 37, 42, 43, 44, 48, 49, 85, 114, 115, 118.

<sup>74</sup> IFRS, [Staff Paper: IASB Meeting: Management Commentary Project Update](#) (2022)

<sup>75</sup> NGFS-INSPIRE Study Group on Biodiversity and Financial Stability, [Central banking and supervision in the biosphere: An agenda for action on biodiversity loss, financial risk and system stability](#) (2022).

<sup>76</sup> [Finance for Biodiversity Pledge](#) (last accessed 9 November 2022).

<sup>77</sup> Fiona Stewart and Samantha Powers, World Bank Blogs, [Nature Action 100: A proposal for targeted investor engagement on biodiversity](#) (June 2021).

<sup>78</sup> Principles for Responsible Investment, [Investor Action on Biodiversity](#) (2020); PRI & UNEP-WCMC, [Mapping natural capital hotspots of depletion](#) (2021).

<sup>79</sup> United Nations Environmental Programme Finance Initiative, Principles for Responsible Banking, [Guidance for banks Version 1. Biodiversity Target-setting](#) (2021).

<sup>80</sup> Finance for Biodiversity Pledge and al., [Finance and Biodiversity Overview of initiatives for financial institutions](#) (2022).

<sup>81</sup> National Capital Finance Alliance, [What's my natural capital exposure?](#) (last accessed 9 November 2022).

<sup>82</sup> Science Based Targets Network (SBTN), [Science-Based Targets For Nature Initial Guidance for Business](#) (September 2020); SBTN, ["Nature-positive" — an opportunity to get it right](#) (June 2021); Nature Positive, [A Global Goal for Nature - Nature Positive by 2030](#) (last accessed 9 November 2022).

actors.<sup>83</sup> Investors and standard setters have for some time been requesting disclosure of climate-related lobbying activities and trade association activities of their investees. Vis-à-vis climate change, some require alignment with The Global Standard on Responsible Climate Lobbying, an appendix of 14 indicators outlining investors' expectations of companies, on a comply or explain basis, including policy commitments, governance, actions and disclosures.<sup>84</sup> The standard is supported by a coalition of high-profile investor networks with more than US\$130 trillion of collective assets under management. The coalition has signed an investor statement of intent, calling on companies to practise responsible climate lobbying aligned with the Paris Agreement goals and accepting their own role in demonstrating similar best practice on climate policy lobbying.<sup>85</sup>

A recent case was brought by a coalition of institutional investors against Volkswagen (VW) on whether VW could refuse to table minority shareholder resolutions, where the resolution in question requested information about VW's climate-related lobbying.<sup>86</sup> In this situation, the possibility for legal risk arises from the potential reputational and operational damage associated with the contradiction between publicly working towards environmental goals whilst privately lobbying against policies to further those goals. Following the trajectory of climate change, increasing scrutiny of companies' activities around biodiversity-related lobbying creates a potential legal risk that directors may need to consider.

A study of industry associations representing five key sectors with the greatest impact on biodiversity found that these associations lobby to block progress on major biodiversity-relevant policies and regulations.<sup>87</sup> The study has prompted investors to request transparency. It also comments that *"companies and their trade associations must align their lobbying activities with biosphere integrity"* and that companies *"should be conscious of the lobbying activities they are supporting and seek to ensure they are aligned with their nature goals"*.<sup>88</sup>

**What does this mean for companies and their boards?** It is conceivable that biodiversity-related lobbying and corporate policy engagement will increasingly receive similar attention to that of climate-related lobbying. Investors may ask for similar levels of disclosure. This creates potential for legal and reputational risk. As with investor expectations around biodiversity-related disclosure, investor questions on this subject may also raise the standards of care and loyalty. Directors of corresponding investee companies need to consider how to govern for this in discharge of their duties.

### 3.4 Rising standards: Biodiversity-related legal risks

Courts are already considering cases against companies in relation to liability for biodiversity loss, indicating an increasing legal risk.

**Litigation arising from value chain or subsidiary activities.** A 2021 case against the French supermarket chain Casino alleged that Casino's yearly due diligence plans failed to detail the environmental and human rights harms caused by the supply of cattle from deforested areas to Casino's Brazilian subsidiary. The plaintiffs allege that the yearly vigilance plans released by Casino, in accordance with French law, lack substance and/or applicability, and demand a detailed compliant vigilance plan identifying risks caused by

<sup>83</sup> See Climate Lobbying, [Global Standard on Responsible Climate Lobbying, Context](#) (last accessed 9 November 2022); and see the definition of climate lobbying in Climate Lobbying, [Appendix to the Global Standard On Responsible Corporate Climate Lobbying](#) (last accessed 9 November 2022), where "climate significant" means non-trivial implications for realising the temperature goals of the Paris Agreement.

<sup>84</sup> Climate Action 100+, [Climate Action 100+ Net-Zero Company Benchmark](#) (2021); Transition Pathway Initiative, [Methodology and indicators report](#) (2017); Climate Lobbying, [Responsible Climate Lobbying: the Global Standard](#) (last accessed: 9 November 2022).

<sup>85</sup> Climate Lobbying, [Responsible Climate Lobbying: The Global Standard, About](#) (last accessed: 9 November 2022); Climate Lobbying, [Investor statement of intent: Global Standard on Responsible Climate Lobbying](#) (2022); Edie, [\\$130trn investor coalition commits to end support for corporates that block climate action](#) (March 2022).

<sup>86</sup> Financial Times, [VW faces legal action over climate change lobbying activities](#) (October 2022).

<sup>87</sup> InfluenceMap, [Pilot Study Demonstrating Industry Associations' Engagement on Biodiversity-related Policy and Regulations](#) (October 2022).

<sup>88</sup> Quotes from Head of Stewardship - Americas, BNP Paribas Asset Management, Vice President, Analyst, Responsible Investments, Columbia Threadneedle Investments and Global Stewardship Lead for Biodiversity, HSBC Asset Management: InfluenceMap, [Pilot Study Demonstrating Industry Associations' Engagement on Biodiversity-related Policy and Regulations](#) (last accessed 9 November 2022).

the activities of the group.<sup>89</sup> This linkage between location of harm and the headquarters of the company driving the harm is important in the biodiversity context, where value chains often separate the economic drivers of harm from the ecosystem where it is felt.

Further examples of legal claims in relation to harms committed by a company's subsidiaries can be seen in the UK, where courts have recently accepted jurisdiction over claims brought by victims of environmental harms caused by defendants' foreign subsidiaries in Zambia, Nigeria and Brazil.<sup>90</sup> Although the substantive judgments in these cases are pending, they demonstrate English courts' willingness, in certain circumstances, to look at the structures of the corporate defendants and the oversight exercised by head offices over their subsidiaries, in order to assess the extent to which the parent company assumed responsibility for its subsidiaries' actions.<sup>91</sup> Alongside similar examples in the Netherlands<sup>92</sup> and Canada (see [Spotlight: Canada](#)),<sup>93</sup> these cases indicate that courts will not preliminarily strike out lawsuits against parent companies, simply because the allegedly illegal conduct was perpetrated by their foreign subsidiaries. Although some of these cases deal with alleged human rights abuses, the same legal principles could allow for lawsuits against corporate parent companies for the impacts of their subsidiaries in biodiversity-rich regions. This creates an extraterritorial forum for litigation.

In the US, investors in the wood pellet production company Enviva filed a biodiversity-related securities class action against Enviva and its directors. It alleged (among other things) misrepresentation of the environmental sustainability of its wood pellets. The main allegation is that Enviva's inventories of hardwood trees are decreasing, replaced by pine seedlings and negatively impacting forest biodiversity. The plaintiffs cite academic and scientific studies of satellite imagery which evidence that it was "very likely" that Enviva's pellet mill operations contributed to elevated rates of deforestation in the area and indicating that Enviva is procuring wood using the practice of clear-cutting.<sup>94</sup> Like the French and UK cases mentioned above, this case highlights the role of value chains in creating legal risk for biodiversity loss. It indicates a correlation between increasing value chain transparency and biodiversity legal risk.

**Litigation relating to disclosure duties.** In Australia, as mentioned above, a potential claim against ANZ Bank might soon be filed on the grounds that the Corporations Act requires its directors' report to disclose that biodiversity loss represents a material risk and describe how ANZ Bank manages exposure to biodiversity risks.<sup>95</sup>

**Litigation relating to international environmental crime.** The campaign for the introduction of 'ecocide' as a crime may influence future litigation in relation to environmental harms. An independent expert panel suggested adding the following definition of the crime of ecocide to Article 5(1) of the Rome Statute of the International Criminal Court. "*Unlawful or wanton acts committed with knowledge that there is a substantial likelihood of severe and either widespread or long-term damage to the environment being caused by those acts*".<sup>96</sup> Ecocide has already been introduced in French criminal law and at least 15 countries have recorded some interest in criminalisation of ecocide at the government or parliamentary level.<sup>97</sup> While debate on ecocide is

<sup>89</sup> *Envol Vert et al. v. Casino* (pending): see Climate Change Litigation Databases, Sabin Centre for Climate Change Law, [Climate Case Chart Envol Vert et al. v. Casino](#) (2021). The claim is based on the French 2017 Corporate Duty of Vigilance Law.

<sup>90</sup> *Vedanta Resources and Others v. Lungowe and Others* [2019] UKSC 20; *Okpabi and Others v Royal Dutch Shell Plc and another* [2021] UKSC 3; *Municipio de Mariana v BHP Group (UK) Lrd and another* [2022] EWCA Civ 951.

<sup>91</sup> Nigel Brook, Zaneta Sedilekova and Catriona Campbell, Law Society of England and Wales, [Addressing biodiversity loss – evolution or revolution of English law?](#) (2022).

<sup>92</sup> European Commission, [Study on due diligence requirements through the supply chain. Part III. Country reports](#) (2020).

<sup>93</sup> *Nevsun Resources Ltd v Gize Yebeyo Araya and Others* [2020] SCC 5.

<sup>94</sup> *Fagen v Enviva Inc.*, No. 22-cv-02844 (D. Md. 2022).

<sup>95</sup> Financial Review, [ANZ under pressure to reveal biodiversity risk](#) (29 August 2022).

<sup>96</sup> Ian Profiri, Jurist, [Legal experts present definition of ecocide for adoption by ICC](#) (23 June 2021).

<sup>97</sup> [Article 279, Loi n° 2021-1104 du 22 août 2021 portant lutte contre le dérèglement climatique et renforcement de la résilience face à ses effets](#); for a critique on the effectiveness of the legal intervention see Aline Giraudat, [Notre Affaire à Tous et la Loi Climat et Résilience](#) (2021). Proposals on institution of ecocide have been suggested to date in Bangladesh, Belgium, Bolivia, Brazil, Chile, Finland, France, Luxembourg, the Maldives, Netherlands, Scotland, Spain, Sweden, the UK and Vanuatu, as well as in the EU: Jojo Mehta, UNA-UK, [Ecocide as an international crime](#) (2021).



ongoing, the International Criminal Court has been requested to open an investigation into former Brazilian President Bolsonaro. This is on the basis of Article 7 of the Statute of Rome (crimes against humanity),<sup>98</sup> alleging significant connections between environmental degradation and crimes against humanity. The complaint alleges that Bolsonaro facilitated “*severe damage to the functions of the Amazon Biome caused by deforestation, conversion of deforested land to cattle ranching, and vast intentional forest fires*”. This has disrupted this critical ecosystem causing “*profound suffering and loss of life on local, regional and global populations alike*”.<sup>99</sup> While this complaint is based on Article 7 rather than the proposed Article 5(1) (ecocide), future cases on the responsibility of company directors with high impacts on critical ecosystems may take inspiration from its legal arguments.

**Litigation against governments.** There are multiple examples of cases around the world against governments relating to biodiversity, that indicate increasing appetite of litigants for biodiversity claims. This includes the US, Turkey, France, Ecuador, Australia (see [Spotlight: Australia](#)), Argentina, Colombia, China, Costa Rica, Tanzania and the Philippines.<sup>100</sup>

**Litigation against directors.** While it does not appear that there are any recorded cases against directors in relation to company law duties and biodiversity loss, there are cases against directors for mismanagement of climate risk. For example, shareholders have threatened a derivative action against Shell’s board of directors in the UK over alleged mismanagement of material and foreseeable climate risk. The claimants argue that Shell is seriously exposed to the physical and transition climate risks. They allege its directors have failed to adopt and implement a climate strategy that aligns with the goals of the Paris Agreement, prepares them for the net zero transition and mitigates these risks. The claimants allege that this failure threatens the long-term value of the company and may mislead investors, breaching the directors’ duties to promote the company’s success, and to exercise reasonable care, skill and diligence.<sup>101</sup> A similar reasoning could be adopted in biodiversity loss cases against boards’ mismanagement of foreseeable and material biodiversity risks.

**What does this mean for companies and their boards?** Courts’ willingness to consider a) biodiversity cases; and b) the possibility of a multinational parent company’s liability for harms caused by overseas subsidiaries means that companies’ biodiversity impacts may create legal risks. This is particularly important in the biodiversity context because of the role of value chains described above. Directors of parent companies may want to consider addressing the biodiversity impacts of their subsidiaries and supply chain to ensure that they fulfil their duties of care and loyalty.

Directors wishing to protect themselves from the possibility of such claims (and to aim for best practice as illustrated in Figure 1) may want to incorporate oversight of the company’s biodiversity dependencies, impacts, risks and opportunities into their strategy and risk management processes.

### 3.5 Rising standards: Regulatory developments with extraterritorial effect

**Global due diligence requirements.** Various proposed and enacted due diligence legislation around the world demonstrates that governments are responding to the elevated risk of biodiversity loss and climate change. Such legislation may have the effect of cascading information requests and increased transparency through value chains outside territories where the legislation is in force. Developments include legislation in

<sup>98</sup> Article 7(h) of the [Rome Statute of International Criminal Court](#).

<sup>99</sup> Climate Case Chart, Sabin Center for Climate Change Law, [The Planet v Bolsonaro](#) (pending) (2021).

<sup>100</sup> ClientEarth, [10 Landmark Cases for Biodiversity](#) (2021); Constitutional Court of Colombia Decision [C-035/16](#) of February 8, 2016 (summarised at [Climate Case Chart](#)); Argentina, [Asociación Civil por la Justicia Ambiental v. Province of Entre Ríos, et al.](#) (2020); France, [Notre Affaire à Tous et al v. French State](#) (2022); Turkey, [S.S. Gölarmara ve Çevresi Su Ürünleri Kooperatifi v. Republic of Türkiye Ministry of Agriculture and Forestry, Manisa Directorate of Provincial Agriculture and Forestry](#) (2022); US, [Center for Biological Diversity v. EPA](#) (2022); Australia, [Bob Brown Foundation Inc v Minister for the Environment \(No 2\)](#) [2022] FCA 873 (2022); Ecuador [Caso Nro. 1149-19-JP/21: Revisión de Sentencia de Acción de Protección Bosque Protector Los Cedros](#) (2021)

<sup>101</sup> ClientEarth, Press Release, [ClientEarth starts legal action against Shell’s Board over mismanagement of climate risk](#) (March 2022); ClientEarth, [Redirecting Shell](#) (2022); ClientEarth, ClientEarth shareholder litigation against Shell’s Board FAQ (March 2022).

various European countries and the EU,<sup>102</sup> the Japanese Guidelines on Respecting Human Rights in Responsible Supply Chains (which may encompass environmental impacts linked to human rights) and the proposed US Federal Supplier Climate Risks and Resilience Rule, targeted at the supply chains of contractors to the Federal government (which will cover information on climate impacts, as one of the drivers of biodiversity loss.)<sup>103</sup> All of these developments can reach companies all around the world through information requests from companies in their value chain who are subject to these rules.

While non-legally binding, the OECD Guidelines for Responsible Business Conduct cite ecosystem degradation and destruction of biodiversity as examples of adverse impacts. These guidelines are best practice in the OECD member countries, predominantly in the Americas, Europe, Oceania and a few countries in Asia.<sup>104</sup> The OECD member countries have 'national contact points' to solve conflicts and difficulties for corporations in implementing the guidelines, including through handling of complaints, mediation and stakeholder engagement, with the potential to improve corporations' supply chain due diligence process.<sup>105</sup>

**Global applicability of the EU due diligence regulations.** The EU aims to introduce trailblazing mandatory regulations on environmental due diligence. While EU law is not directly applicable to multinationals incorporated and doing business outside the relevant jurisdictions, there are two ways in which it may affect interpretation of directors' duties globally. Firstly, through extraterritorial effect, where it passes obligations to either companies in the upstream or downstream of the value chain located outside the EU. Secondly, by setting a global best practice standard that other jurisdictions may wish to emulate (as in the case of the EU General Data Protection Regulation).<sup>106</sup>

The proposed EU regulation on deforestation-free products will make it obligatory for companies to verify that commodities (including cattle, cocoa, coffee, oil palm, soya and wood) sold in the EU have not been produced on deforested or degraded land.<sup>107</sup> The proposed EU Corporate Sustainability Due Diligence Directive (the **CSDD Directive**)<sup>108</sup> will require both EU companies and non-EU companies with a certain EU turnover to conduct entire value chain due diligence on actual or potential biodiversity impacts<sup>109</sup> (and other specified environmental and human rights impacts). This includes identifying, preventing or mitigating adverse biodiversity harms.<sup>110</sup> The CSDD Directive requires companies to neutralise or minimise actual

<sup>102</sup> CCLI and Climate Governance Initiative, [Climate Change And ESG-Related Risks In Value Chains: What Board Directors Need To Know](#) (December 2022) 8-10. Adopted legislation in: France - Due Diligence Law ([Law no. 2017-399 of March 27, 2017 relating to the duty of care of parent companies and ordering companies](#)); Germany - [Act on Corporate Due Diligence Obligations in Supply Chains](#); Norway - [Transparency Act 2022](#). Proposed legislation in: Austria - [Motion](#) - Supply Chain Due Diligence; Belgium - [Proposal on Duty of Vigilance](#); Finland - Proposed legislation on human rights due diligence (See government [memorandum](#) dated 12 April 2022); Netherlands - [Bill on Responsible and Sustainable International Business Conduct to the Dutch House of Representatives](#); UK - Environment Act 2021 ([Schedule 17](#)); EU - [Corporate Sustainability Due Diligence Directive](#); EU - [Proposal](#) for a regulation on deforestation-free products ([adopted](#) by Parliament).

<sup>103</sup> CCLI and Climate Governance Initiative, [Climate Change And ESG-Related Risks In Value Chains: What Board Directors Need To Know](#) (December 2022) 8-10; Japan, [Guidelines on Respecting Human Rights in Responsible Supply Chains](#) (September 2022); US White House, Factsheet, [Biden-Harris Administration Proposes Plan to Protect Federal Supply Chain from Climate-Related Risks](#) (November 2022)

<sup>104</sup> OECD, [Guidelines for Responsible Business Conduct](#) (2018); CCLI and Climate Governance Initiative, [Climate Change And ESG-Related Risks In Value Chains: What Board Directors Need To Know](#) (December 2022).

<sup>105</sup> Climate Change Litigation Databases, Sabin Centre for Climate Change Law, [Search Results: OECD](#) (last accessed 8 December 2022). See for example Climate Change Litigation Databases, Sabin Centre for Climate Change Law, [BankTrack et al. vs ING Bank](#) and [Development YES - Open-Pit Mines NO v. Group PZU S.A.](#)

<sup>106</sup> Politico, [Europe's new data protection rules export privacy standards worldwide](#) (2018).

<sup>107</sup> EU - [Proposal](#) for a regulation on deforestation-free products ([adopted](#) by Parliament).

<sup>108</sup> European Commission, [Proposal for a Directive of the European Parliament and of the Council on Corporate Sustainability Due Diligence and amending Directive \(EU\) 2019/1937](#) (2019) (CSDD Proposal). See also the EU regulations on traceability of illegal logging for an example of due diligence legislation that may place requirements on suppliers in other jurisdictions: European Parliament and European Council, [Regulation \(EU\) No 995/2010 on the obligations of operators who place timber and timber products on the market](#) (2010).

<sup>109</sup> Biodiversity loss can fall under the definition of 'an adverse environmental impact' under Article 3(b) CSDD Proposal either by violating the obligation under Article 10 (b) of the [Convention on Biological Diversity](#) to take necessary measures to avoid or minimise adverse impacts on biological diversity, or by breaching human rights where there is harmful soil change, water or air pollution, harmful emissions, excessive water consumption or other impacts on natural resources, that impair food production, deny access to safe water, harm health or economic rights, or affect ecological integrity.

<sup>110</sup> Articles 4, 6, 7, 8 CSDD Proposal.

adverse impacts by paying financial compensation and developing a corrective action plan, among other things.<sup>111</sup> The CSDD will oblige EU Member States to adopt a civil liability regime for failure to comply with the due diligence process<sup>112</sup> and extend their laws relating to directors' duties to provide that directors of EU companies covered by the CSDD Directive must take into account sustainability matters (including environmental consequences) in the short, medium and long term when fulfilling their duty to act in the best interest of the company.<sup>113</sup> This development points towards an aptitude of the EU to use corporate laws to prevent and minimise negative biodiversity impacts beyond its borders.

**What does this mean for companies and their boards?** The extraterritorial effect of the CSDD Directive, the EU regulation on deforestation-free products and other similar laws in other parts of the world on value chain due diligence are likely to increase transparency around previously hidden biodiversity impacts of companies. Such transparency may raise the standards of care and loyalty for directors of companies whose regulatory requirements or value chain partners require them to undertake biodiversity due diligence. If such due diligence and transparency become part of business norms globally, this may also extend to directors of all companies.

### 3.6 *Rising standards: Natural asset companies, impact investment and natural capital accounting*

Natural asset companies are a new asset class based on ecosystem services that capture the intrinsic and productive value of nature within natural assets (for example forests, wetlands and coral reefs).<sup>114</sup> Investors are increasingly investing for impact (i.e. not only to pursue financial gain but to simultaneously prioritise environmental and social goals),<sup>115</sup> governments are undertaking natural capital accounting<sup>116</sup> and multinational companies are including audited Environmental Profit and Loss accounts in annual reports.<sup>117</sup>

**What does this mean for companies and their boards?** All of these developments are bringing biodiversity into the financial mainstream and may influence market perceptions, prompting directors to consider business externalities as an integral part of risk management, strategy and accounting. This effect on market norms may elevate the standards of care and loyalty expected of directors in accounting for biodiversity within their governance, strategy and decisions.

### 3.7 *Rising standards: Novel legal personhood of natural assets ('rights of nature')*

In practical terms, legal personhood of natural assets (known as 'rights of nature') removes the traditional barriers in environmental litigation. Vesting protected rights in a natural asset enables litigation in the asset's own right. This removes the barrier often encountered by human claimants to establish that environmental damage has caused them personal harm, which is what gives them 'standing' to bring the claim.

<sup>111</sup> Article 8 CSDD Proposal.

<sup>112</sup> Article 22 CSDD Proposal.

<sup>113</sup> Article 25 CSDD Proposal; European Commission, [Proposal for a Directive on corporate sustainability due diligence and Annex](#) (2022).

<sup>114</sup> New York Stock Exchange, [Introducing Natural Asset Companies](#) (2022).

<sup>115</sup> Freshfields Bruckhaus Deringer, [A Legal Framework for Impact](#) (2021); Impact investing is a type of investing where investors pursue social and environmental aims alongside financial aims.

<sup>116</sup> The White House, Briefing, [Accounting for Nature on Earth Day 2022](#) (April 2022); European Commission, [Biodiversity: ground-breaking change to economic reporting accounting for nature's contribution to economy](#) (2021); UK Office for National Statistics, [Natural Capital Accounts](#) (September 2022); United Nations, [System of Environmental-Economic Accounting](#) (last accessed 10 November 2022).

<sup>117</sup> Kering, [Universal Registration Document Annual Financial Report - Integrated Report](#) (2021) 278; Kering, [Environmental Profit & Loss \(EP&L\) 2021 Group Results](#) (2021); Puma, [Puma And PPR Home Announce First Results Of Unprecedented Environmental Profit & Loss Account](#) (2011); Puma, [Annual Report](#) (2021); Kering, [What is an EP&L?](#) (2022); University of Cambridge Institute for Sustainability Leadership (CISL), [Biodiversity and ecosystem services in environmental profit & loss accounts](#) (2016); CISL, Kering and The Natural Capital Project, [Biodiversity and ecosystem services in corporate natural capital accounting](#) (2016).

There is evolving non-anthropocentric legal recognition of the inherent rights of nature in constitutions, statutes, local municipal and Indigenous laws and declarations, and court decisions. These authorities grant legal standing to natural assets, ecosystems and species, including rivers, glaciers, waterfalls, meadows, lakes and forests. These developments have been seen mainly in Canada (see [Spotlight: Canada](#)), the US, India (see [Spotlight: India](#)), New Zealand and many Latin American states.<sup>118</sup> The concept of 'rights of nature' is based upon the principle that humankind and nature are in a relationship of shared co-existence that should be respected by legal systems and awarded equal status. Although this context is jurisdiction- and location-specific, it is changing relatively rapidly. Legal recognition is starting to emerge in Europe, with proposals in France and Ireland, and Spain granting legal personhood to its Mar Menor lagoon.<sup>119</sup> A UK company recently recognised the rights of nature by appointing a corporate director to its board to serve as a proxy representative legally bound to speak on behalf of nature. This appointment aims to assist all directors to think more expansively about potential impacts to nature in their decision-making.<sup>120</sup> This appointment is not a right recognised in law and is unlikely to affect the standard applicable to other boards. Neither is it suggested that this is a necessary step in order for boards to consider biodiversity risk. However, it can serve as an example to directors of other companies of the types of considerations that may apply.

**What does this mean for companies and their boards?** Companies may need to identify if they are operating (either through value chains or subsidiaries) in a specific regional location (applicable in over 30 countries) where legal personhood of natural assets is relevant. They can then assess whether they could be in breach of local laws or their directors' duties in relation to company activities. Companies that do not operate in these territories may only need such awareness as part of horizon scanning of distant potential risks. Legal recognition of the rights of nature presents an emerging legal risk with a potential to accelerate biodiversity litigation against corporate actors. It is therefore a risk that directors may need to factor into corporate governance.

### 3.8 *Rising standards: Conclusion*

All of the above market, social and regulatory context demonstrates that biodiversity-related matters are increasingly being considered by governments, regulators, standard setters, investors, courts and legislators. This consideration includes physical and transition risks and opportunities, value creation and legal risks, which all have a bearing on the interpretation of standards of care and loyalty.

This context may affect a company directly through specific disclosure or reporting obligations, with a corresponding effect on directors' duties in company law (which the law interprets objectively in light of prevailing norms). Alternatively, the developments described above may alter the general market perception of biodiversity risk and value in a sector or jurisdiction so as to raise the applicable standards for a wider group of companies beyond those immediately affected by legislative or investor requirements.

<sup>118</sup> United Nations, Harmony with Nature Platform, [Rights of Nature Law and Policy](#) (last accessed 10 November 2022).

<sup>119</sup> United Nations, Harmony with Nature Platform, [Rights of Nature Law and Policy](#) (last accessed 10 November 2022).

<sup>120</sup> Faith in Nature, [A Vote for Nature](#) (last accessed 10 November 2022); Faith In Nature, [Faith In Nature Appoints Nature To Board Q&A](#) (last accessed 10 November 2022).

#### 4 Biodiversity specific considerations for governance and disclosure

This section offers a biodiversity-specific conceptual framework to outline the relevance of biodiversity for companies through the lens of corporate law and directors' duties. In particular, it should aid understanding of foreseeability and materiality of biodiversity risks and opportunities. It does not seek to offer conclusions, rather raise key questions and provide preliminary indicia to aid directors when considering biodiversity.

As mentioned in section 2.1 above, detailed in section 4 of [Appendix 1](#) and comprehensively illustrated in [Appendix 2](#), many companies are highly likely to have dependencies and impacts on biodiversity. This ranges from peripheral to significant and varying in degree of foreseeability, depending on their activities, location and complexity of their value chains. **The relevance of biodiversity dependencies and impacts to directors depends on their foreseeability and materiality.**

For the purposes of governance and oversight of internal risk management, both materiality and foreseeability of risks and opportunities are relevant. Both factors will influence the interpretation of the directors' standards for care and loyalty depending on the circumstances specific to the company. As outlined above (section 3.2), what is material for the purposes of a company's disclosure and reporting may elevate the standard of directors' duties to govern the risks and opportunities disclosed. Therefore, for the remainder of this paper we discuss materiality as applied to both disclosure and governance of risk.

For disclosure and reporting purposes, materiality traditionally represents a threshold of whether a company or investor deems information sufficiently relevant in relation to the company's financial position. Material information can include information relating to past performance and future prospects and is likely to include both quantitative and qualitative factors.<sup>121</sup> The assessment of relevance may include considerations such as:

- A) a reasonable expectation that the information may influence the primary users of the financial reporting suite;<sup>122</sup>
- B) whether it is substantially likely that a reasonable person would consider the information important;<sup>123</sup>
- C) the significance of the information in relation to a set of financial or performance data;<sup>124</sup> and
- D) consideration of both quantitative and qualitative factors to assess if a reasonable investor would consider the information relevant to its decision whether or not to invest in a company.<sup>125</sup>

This approach (termed 'single materiality') reflects a one-way relationship between the company and the environment, only considering risks that environmental issues pose to companies.<sup>126</sup>

There has been a shift beyond the 'single materiality' approach for companies to consider both the factors impacting the company and the company's impacts on those factors. This approach (termed 'double materiality') reflects a two-way relationship between companies and the environment. Double materiality entails assessing both the risks posed **to** the company (inward materiality) and the risks posed **by** the company (outward materiality).<sup>127</sup> This is the approach adopted by the TNFD (see Figure 4 and section 4.2).

<sup>121</sup> CCLI, [Concerns misplaced: Will compliance with the TCFD recommendations really expose companies and directors to liability risk?](#) (2017) 7, 10.

<sup>122</sup> International Accounting Standards Board, [International Financial Reporting Standards, Definition of Material Amendments to IAS 1 and IAS 8](#) (2018) 2.

<sup>123</sup> US Securities and Exchange Commission, [17 CFR Part 211 \[Release No. SAB 99\] Staff Accounting Bulletin No. 99 - Materiality](#) (1999).

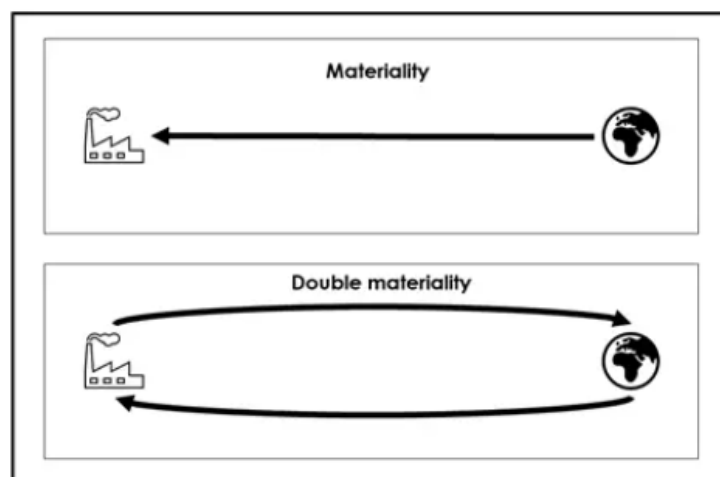
<sup>124</sup> The World Bank Group, [The Economic Case for Nature](#) (2021), Glossary XXIV, referencing the [OECD online glossary](#).

<sup>125</sup> The World Bank Group, [The Economic Case for Nature](#) (2021), Glossary XXIV, referencing CCLI, [Concerns misplaced: Will compliance with the TCFD recommendations really expose companies and directors to liability risk?](#) (2017).

<sup>126</sup> Vis-à-vis climate change, these risks are physical, transition and liability risk. See Alessia Stalker and Alice Garton, CCLI, [Directors' Liability and Climate Risk: United Kingdom - Country Paper](#) (2018).

<sup>127</sup> J. Boissinot et al., INSPIRE Sustainable Central Banking Toolbox Policy Briefing Paper 5, [Aligning financial and monetary policies with the concept of double materiality: rationales, proposals and challenges](#) (June 2022).

**Figure 2: Double materiality**



Source: LSE and Grantham Research Institute on Climate Change and Environment.<sup>128</sup>

There is some debate as to whether

- a) the risks posed **by** the company (through its impacts) are relevant to directors' duties and disclosure obligations only if they create risk **to** the same company. (Here, outward materiality effectively also becomes inward materiality.)

Or,

- b) the risks posed **by** the company need to be managed and disclosed by the company in their own right, since they can pose risks to other companies, society, community and the environment.

We can examine this in the following categories:

- i) Risks and opportunities **to** the company arising from:
  - the company's biodiversity dependencies; and
  - the company's biodiversity impacts.
- ii) Risks posed **by** the company arising from the company's biodiversity impacts (which **do not** create any quantitatively significant or material risk **to** the company).

<sup>128</sup> LSE and Grantham Research Institute on Climate Change and Environment, ['Double materiality': what is it and why does it matter?](#) (2021).

#### 4.1 *Are boards legally permitted or required to govern and disclose biodiversity risks and opportunities to the company?*

##### 4.1.1 *Risks and opportunities arising from the company's dependencies on ecosystems*

It is foreseeable that significant **dependencies** on biodiversity-dependent ecosystem services that are at risk or in decline could give rise to material risk or opportunity to a company. This is especially the case if loss of biodiversity has a high likelihood of directly or indirectly threatening the company's income stream or value chains. Like any other foreseeable and material risk to an organisation, this risk requires consideration, appropriate strategic response and potential disclosure. For example, a company supplying agricultural products that are highly dependent on biodiversity-enabled pollination ecosystem services is vulnerable to the decline in diversity of pollinator populations. (See the [agricultural case study](#) for detail on the risks associated with dependencies on pollinator services). This is potentially a foreseeable and material risk to that company created by its dependency on biodiversity.

**What does this mean for companies and their boards?** Such dependencies are likely to result in foreseeable and financially material risks under several of the considerations listed in A)-D) at the beginning of this section 4. There can also be opportunities to address such dependencies. Such risks fall squarely within what the law permits directors to consider and disclose. In some instances, the law may require these risks to be governed and disclosed.

##### 4.1.2 *Risks and opportunities arising from the company's impacts on ecosystems*

A company's **impacts** on biodiversity have the potential to create foreseeable and material risk to its business **where such impacts affect the same set of ecosystem services on which it has dependencies**. For example, the biodiversity impacts of an agricultural company may directly impact its biodiversity dependencies on pollinator services where the company's agricultural practices contribute to, for instance, habitat loss, one of the main drivers of pollinator decline.<sup>129</sup> Change of land use due to agricultural production is responsible for over 80% of tropical deforestation and habitat loss.<sup>130</sup> In addition, the intensification of agricultural production has been directly linked to an average 70% decline in pollinators' populations.<sup>131</sup> It follows that the agricultural industry's exposure to biodiversity risk is to a large extent driven by its own activities. This could be described as a symmetry between its contribution to biodiversity loss and its vulnerability to the resulting biodiversity risks.

**What does this mean for companies and their boards?** The link between the agricultural industry's biodiversity dependencies and impacts makes the biodiversity risks stemming from the industry's impacts foreseeable and financially material for its business. This can be true even if an impact is not significant enough. For example, if it does not render a species extinct but is still contributing to the decline in biodiversity that the company relies on. The impact therefore creates foreseeable physical risks to the company in the event of loss of the related ecosystem services on which the company depends. The law permits governance and disclosure of such risks and may even require it. Well informed, prudent directors will want to put in place proactive risk governance to identify, manage and disclose such risks.

However, a company's **impacts** on biodiversity will sometimes occur in **ecosystems on which its business activities do not depend**. We cannot always assume a symmetry between contribution and exposure to biodiversity risks. Academics have found significant gaps between environmental dependencies and environmental impacts.<sup>132</sup> Companies may have dependencies and impacts on more than one ecosystem

<sup>129</sup> Other drivers include use of agrochemicals, pathogens, alien species, climate change and interactions between them – see Simon G. Potts et al., [Global pollinator declines: trends, impacts and drivers](#) (2010) 25(6) Science.

<sup>130</sup> Hannah Ritchie, Our World Data, [Cutting down forests: what are the drivers of deforestation?](#) (February 2021).

<sup>131</sup> Joseph Millard et al., [Global effects of land-use intensity on local pollinator biodiversity](#) (2021) 12(2902) Nature Communications.

<sup>132</sup> Cam Simpson, Akshat Rathi, and Saijel Kishan, Bloomberg Businessweek, [The ESG Mirage](#) (2021).

service and their dependencies and impacts may not correspond to the same ecosystem. Those impacts may still create foreseeable and material risks and opportunities to the company.

For example, imagine a company that manufactures aeroplanes, the tyres of which are made from a special conductive rubber latex to neutralise electricity created naturally through friction on landings and take-offs and avoid damage to the aeroplane's electrical components.<sup>133</sup> Almost all conductive rubber in the world is sourced from *Hevea brasiliensis* (i.e. rubber trees), grown at scale on monoculture plantations in tropical Asia. The rubber tree has been artificially introduced in Asia by humans to avoid the pests and parasites, which prevented scaling of its agricultural growth in its native Amazon rainforest.<sup>134</sup> Through its supply chain, the aeroplane manufacturer in our example is dependent on a natural product derived from a restricted geographical location. Scientific research has estimated that if Amazonian parasites spread to tropical Asia the entire global production of conductive rubber could be wiped out within a decade.<sup>135</sup> This would cause massive interruption to the entire aviation industry and large losses to its financiers. The dependency on the rubber provisioning ecosystem service could therefore be viewed as a material risk to our aeroplane manufacturing company. Incidentally, rubber trees supply 90% of the world's rubber, used in approximately 40,000 products, so the aviation industry is just one of the many sectors that are dependent on the rubber tree's ecosystem.<sup>136</sup>

Looking at the aeroplane manufacturer's impacts on biodiversity, its aeroplanes may, via international travel, facilitate the introduction of pests to Asia and contribute to wiping out of rubber trees. However, this is coincidental and not caused by its aeroplanes' environmental impacts. The aeroplane manufacturer's impacts on biodiversity are found elsewhere, closely linked to greenhouse gas emissions and other non-CO2 warming effects generated by aeroplanes in the manufacturer's value chain<sup>137</sup> that harm biodiversity in significant respects.<sup>138</sup> It will also have biodiversity impacts from its terrestrial infrastructure (which can contribute significantly to habitat loss and degradation, and pollution). This does not directly affect the rubber tree's ecosystem, but potentially affects the ecosystems upon which other companies depend. It is unlike an agricultural company's impacts, where each square kilometre of land converted from a forest to a field can directly contribute to pollinator decline). Every aeroplane produced by the company does not contribute to the population of rubber tree parasites and thus the tree's demise. There is no correlation between the aeroplane manufacturer's impacts on biodiversity and the risk created by its dependency on the rubber tree. Notwithstanding the absence of a link between the aeroplane manufacturer's dependencies and impacts, the manufacturer's impacts may still be a source of foreseeable and material risks to its business. Other companies or local communities may complain about its impacts on ecosystems that their business depends on, or it may affect access to finance from the company's lenders or investors.

**What does this mean for companies and their boards?** Even where a company is not dependent on the biodiversity that it is impacting, its failure to manage or accurately represent its biodiversity impacts can cause adverse publicity, and legal risk in the form of litigation, arbitration, regulatory investigations and penalties.<sup>139</sup> These risks manifest as second-order effects of a company's impacts on biodiversity, which may nevertheless be damaging to both its reputation and financial performance. Such reputational or legal risks may have financial consequences for a company. Prudent directors will ask whether the company's

<sup>133</sup> Monroe Aerospace, [Why Airplane Tires Are Made of Conductive Rubber](#) (2020).

<sup>134</sup> Plants of the World Online, [Hevea brasiliensis](#) (last accessed 10 November 2022); CABI, [Hevea brasiliensis \(Rubber\)](#) (last accessed 10 November 2022).

<sup>135</sup> Onokpise and Louime, MDPI Sustainability, [The Potential of the South American Leaf Blight as a Biological Agent](#) (2012).

<sup>136</sup> Rousset et al., MDPI Molecules, [Guayule \(Parthenium argentatum A. Gray\), a Renewable Resource for Natural Polyisoprene and Resin: Composition, Processes and Applications](#) (2021); Oghenekome Onokpise and Clifford Louime, MDPI Sustainability, [The Potential of the South American Leaf Blight as a Biological Agent](#) (2012)

<sup>137</sup> UK Civil Aviation Authority, [Environment](#) (2022).

<sup>138</sup> For instance, nitrogen oxides, gas emitted by aeroplanes, although not a greenhouse gas itself, reacts in the atmosphere with sunlight and hydrocarbons to create tropospheric ozone, a powerful GHG. This short-lived climate pollutant contributes to global warming, while also being harmful to biodiversity as it reduces the ability of plants to photosynthesise.

<sup>139</sup> For regulatory risk see ASA, [ASA Ruling on Unilever UK Ltd](#) (August 2022). For reputational risk see Financial Review, [ANZ under pressure to reveal biodiversity risk](#) (29 August 2022).



impacts on biodiversity could create foreseeable and material risks to the company that will need governing and disclosing in order to discharge directors' duties. These impacts are added to the risks caused by the company's impacts on ecosystems on which its business depends, as explored above. Companies may need to assess all impacts in order to understand which of them create foreseeable and material risks. The law permits, and in some cases may require, such risks to be governed and disclosed.

Biodiversity impacts which can create risks to the company will also be relevant for companies that report in accordance with the guidance of the ISSB (see Figure 3). For such companies, it is likely that consideration of these matters for disclosure purposes may elevate the separate company law standards of care and loyalty. If so, it would be necessary for directors to govern those risks as well as disclose them. If the ISSB standards become common market practice, they may further elevate the general standards of care and loyalty applicable to directors' duties in certain jurisdictions and sectors. This includes in relation to companies that do not report using the ISSB framework.

Separately from the ISSB-aligned reporting, companies may have to include information on material risks in their general financial reports, according to guidance produced by the IASB (see section 3.2 above). This would apply where this risk information has a bearing on the assumptions underlying the financial statements or the company's ability to create future value. Again, these market developments may elevate directors' standard of care and loyalty in both governance and signing off on financial reports.

### **Figure 3: Materiality in reporting - International Sustainability Standards Board (ISSB)**

The ISSB has indicated that it only recommends disclosure of impacts that create a risk or opportunity to the same company, i.e. they affect "enterprise value," which is information of interest to investors.<sup>140</sup>

The ISSB recommends disclosure of "information that enables users of general-purpose financial reporting to understand the significant sustainability-related risks and opportunities that could reasonably be expected to affect the entity's business model, strategy and cash flows, its access to finance and its cost of capital, over the short, medium or long term."

It is possible that this definition may include impacts of the reporting company since materiality is qualitative as well as quantitative, and investors increasingly care about companies' impacts on the environment or on society.<sup>141</sup> A board's determination that a particular impact or dependency is not material *to the company* may not obviate the need for them to disclose information that is material *to investors*.

In anticipation of the ISSB standards becoming law or best practice, prudent directors may choose to initiate assessment of their companies' dependencies and impacts on biodiversity. This can prepare the company to identify and disclose those that create foreseeable and material risks or opportunities to the company.

## **4.2 Are boards legally permitted or required to govern and disclose biodiversity risks posed by the company arising from the company's impacts?**

Having established that a company's impacts may create risks **to** the company, what about risks posed **by** the company's impacts, where these impacts do not create foreseeable or material risks or opportunities to the same company? This is currently an open, and interesting, question. It turns partly on whether the law gives impacts of biodiversity equal or greater weight than the financial interests of the company and its shareholders. Here we explore factors that might help directors to decide where impacts may be relevant to

<sup>140</sup> This has been described as "a weak conception of double materiality": Matthias Täger, LSE and Grantham Research Institute on Climate Change and Environment, ['Double materiality: what is it and why does it matter?'](#) (2021).

<sup>141</sup> International Sustainability Standards Board, [Exposure Draft: General Requirements for Disclosure of Sustainability-related Financial Information](#) (2022) 5, 25; Sustainable Views, Financial Times Group, [ISSB's Sue Lloyd on emerging markets and double materiality](#) (September 2022).

their risk governance and disclosure, to discharge their duties of care and for short-term and long-term success of the company.

Firstly, impacts of a company that the company perceives as not quantitatively material (for the purposes of its own risk management or financial position) may nevertheless be qualitatively important to investors.

Impacts may be important due to their capacity to become risks. By the time an apparently non-material issue has become a risk, it may be too late to prevent it ("*dynamic materiality*").<sup>142</sup> The evolving nature of materiality has been acknowledged by all main reporting standards.<sup>143</sup> The rate at which previously immaterial issues become material has been accelerating, influenced by increased transparency and rising stakeholder pressures from better equipped civil society activist groups, which often act before investors have become aware of an issue.<sup>144</sup> The growing responsiveness of key decision-makers, policy makers, consumers and investors to such influences is also impacting dynamic materiality.<sup>145</sup> According to the World Economic Forum, it will be increasingly critical for directors to be able to anticipate risks arising from company impacts, including by embedding positive biodiversity impact within company strategy.<sup>146</sup> It is also likely that companies could benefit from improved reputation and marketability of their sustainability profile if they disclose all biodiversity impacts voluntarily.<sup>147</sup>

However, even where the likelihood of reputational or other risk is low, biodiversity impacts of the company may still be of importance to investors. Investors may measure and manage their investment portfolio's environmental impact to inform their investment decisions or because impacts of one portfolio company may create risks to another portfolio company, creating investment risk. Investors may also be keen for investee companies in their portfolios to govern and disclose all of the company's impacts due to perceived investor duties to a) reshape corporate practices to support the ecological transition,<sup>148</sup> or b) minimise their contribution to systemic risk through their financing of biodiversity-harmful activities.<sup>149</sup>

Conversely, some more traditional interpretations of directors' duties would firmly limit the description of the best interests of a company to financial interests and shareholder returns. By this reasoning the board's role only extends to governance and disclosure of foreseeable and material risks to companies and therefore directors would not need to consider biodiversity impacts that did not raise such risks.

This narrower view may be expanded by legislative amendments. In relation to climate, various jurisdictions are requiring companies to disclose their greenhouse gas emissions (i.e. their climate impacts) and plans to manage them, which brings such impacts within the scope of what directors are expected to manage.<sup>150</sup> The EU has also adopted a wide approach to double materiality as including 'impact materiality' alongside financial materiality.<sup>151</sup> Impact materiality requires that a company identifies sustainability matters that are material in terms of the negative and positive impacts of its own operations and its value chain. This

<sup>142</sup> World Economic Forum, [Embracing the New Age of Materiality: Harnessing the Pace of Change in ESG](#) (2020); J. Boissinot et al., INSPIRE Sustainable Central Banking Toolbox Policy Briefing Paper 5, [Aligning financial and monetary policies with the concept of double materiality: rationales, proposals and challenges](#) (June 2022); Alison Taylor, GreenBiz, [Sustainable investing expert Alison Taylor on ESG misconceptions and why ethics are part of the equation](#) (April 2022).

<sup>143</sup> CDP Disclosure Insight Action et al., [Statement of Intent to Work Together Towards Comprehensive Corporate Reporting](#) (2020).

<sup>144</sup> World Economic Forum, [Embracing the New Age of Materiality: Harnessing the Pace of Change in ESG](#) (2020).

<sup>145</sup> World Economic Forum, [Embracing the New Age of Materiality: Harnessing the Pace of Change in ESG](#) (2020).

<sup>146</sup> World Economic Forum, [Embracing the New Age of Materiality: Harnessing the Pace of Change in ESG](#) (2020).

<sup>147</sup> For potential advantages of assessing and disclosing impacts see Business for Nature, [COP15 Business Statement for Mandatory Assessment and Disclosure - FAQ](#) (2022) (last accessed 6 December 2022).

<sup>148</sup> J. Boissinot et al., INSPIRE Sustainable Central Banking Toolbox Policy Briefing Paper 5, [Aligning financial and monetary policies with the concept of double materiality: rationales, proposals and challenges](#) (June 2022); United Nations Environmental Programme Finance Initiative, Principles for Responsible Investment, [A Legal Framework for Impact: Sustainability Impact in Investor Decision-Making](#) (2021).

<sup>149</sup> J. Boissinot et al., INSPIRE Sustainable Central Banking Toolbox Policy Briefing Paper 5, [Aligning financial and monetary policies with the concept of double materiality: rationales, proposals and challenges](#) (June 2022). See for example Impax Asset Management, [Impax Policy on Nature, Biodiversity, and Deforestation](#) (August 2022).

<sup>150</sup> CCLI and Climate Governance Initiative, [Climate Change Disclosures: What Board Directors Need To Know](#) (2022)

<sup>151</sup> European Commission, Final Report, [Proposals for a relevant and dynamic EU sustainability reporting standard-setting](#) (February 2021); European Commission, [Overview of new guidelines on reporting climate-related information](#) (2017), European Commission, [Commission guidelines on non-financial reporting](#) (2017).

materiality is based on the severity of such impacts and urgency derived from public policy goals and planetary boundaries. Financial materiality requires that a company identifies sustainability matters (including both dependencies and impacts) that are financially material based on evidence that such matters are reasonably likely to affect its value beyond what is already recognised in financial reporting.<sup>152</sup> France's disclosure rules adopt the EU definition of double materiality, requiring French financial institutions to disclose (on a comply or explain basis) biodiversity risks and impacts, their strategy for reducing such impacts and managing risks, specific targets and alignment with international biodiversity goals.<sup>153</sup> These regulations may affect companies outside the EU through their value chains and contribute to market norms that affect directors' duties in other jurisdictions globally.

In the absence of such legislative widening, the evolving standards of materiality for the purposes of disclosure may inform the standard required for directors' duties under company law. The standard for disclosures relating to biodiversity, the TNFD, is in development (see Figure 4). The TNFD has expanded its approach from its original alignment with the ISSB's 'enterprise value' approach (outlined in Figure 3)<sup>154</sup> to encompass disclosure of *all* company biodiversity dependencies and impacts, regardless of their bearing on the company's risk/opportunity profile.<sup>155</sup> There is wide market and governmental support for the TNFD framework,<sup>156</sup> which indicates that regulators and investors may take less time to adopt it than the TCFD.

Even if companies, investors, or regulators do not swiftly adopt TNFD-aligned disclosure requirements, there may be other pressures on directors to govern (if not disclose) their dependencies and impacts on biodiversity, including societal expectations. As we have examined in section 3, the expectation created by the regulatory, market and social context may affect the standards of care and loyalty. This could create reputational risk arising from any impacts of a company that do not meet raised societal expectations. Some commentators say that management of a company's externalities, which could include biodiversity impacts, is necessary for a company to maintain its "social licence". Social licence is a type of soft law which derives not from legally granted permission, but from the development of legitimacy, credibility and trust through perception that a business is acting fairly and appropriately. I.e. businesses exist with permission from local communities, greater society and outside stakeholders. The relevance given to corporate social licence may derive from the corporate social responsibility movement's "*mounting pressures on companies to be seen as responsible corporate citizens*".<sup>157</sup> Originating in the mining industry, the concept embodies an ongoing approval process seen as a prerequisite to continued extraction of resources. Since most biodiversity impacts will be a result of the use of natural resources, it may be that there is an implicit social licence required of companies that use natural resources. Therefore it would be appropriate for directors to apply the stronger definition of double materiality when overseeing the company's biodiversity impacts, in order to fulfil the best interests of the company in continuing to benefit from its social licence.<sup>158</sup>

<sup>152</sup> European Commission, Final Report, [Proposals for a relevant and dynamic EU sustainability reporting standard-setting](#) (February 2021) 8.

<sup>153</sup> Article 29 of the French law on Energy and Climate; Global Canopy, [France's Article 29: biodiversity disclosure requirements sign of what's to come](#) (2021).

<sup>154</sup> TNFD, [The TNFD Nature-Related Risk and Opportunity Management and Disclosure Framework Beta v0.2](#) (June 2022), TNFD, [Summary of feedback on TNFD framework beta v0.1, Feedback on technical aspects of the core components of the v0.1 beta release](#) (2022); TNFD, [Nature in Scope](#) (June 2021) 8.

<sup>155</sup> TNFD, [The TNFD Nature-Related Risk and Opportunity Management and Disclosure Framework Beta v0.3](#) (November 2022). This has been described as "a strong conception of double materiality": Matthias Täger, LSE and Grantham Research Institute on Climate Change and Environment, ['Double materiality': what is it and why does it matter?](#) (2021).

<sup>156</sup> Taskforce on Nature-related Financial Disclosures, [G7 backs new Taskforce on Nature-related Financial Disclosures](#) (June 2021); TNFD, [About](#) (last accessed 10 November 2022); TNFD, [The TNFD Forum](#) (last accessed 10 November 2022).

<sup>157</sup> Hillary A. Sale, [The Corporate Purpose of Social License](#) (June 2019) FN238, 39; Cynthia A. Williams Osgoode Hall Law School Legal Studies, [Corporate Social Responsibility and Corporate Governance](#), in J. Gordon and G. Ringe (eds.) Oxford Handbook of Corporate Law and Governance (Oxford, UK: Oxford University Press, 2018).

<sup>158</sup> McKinsey Quarterly, [Does ESG really matter—and why?](#) (August 2022); Hillary A. Sale, [The Corporate Purpose of Social License](#) (June 2019). Witold Henisz, Knowledge at Wharton, ['Corporate diplomacy': Why firms need to build ties with external stakeholders](#) (2014); Robert G. Boutilier, [A Measure of the Social License to Operate for Infrastructure and Extractive Projects](#) (November 2017).

**Figure 4: Materiality in disclosure - Task Force on Nature-related Financial Disclosures (TNFD)**

Companies disclosing pursuant to the TNFD framework will need to disclose:

- their nature-related dependencies, impacts, risks and opportunities (**DIRO**);
- how they identify, assess and manage DIRO as part of risk management;
- how they perform against the targets they have set to manage DIRO; and
- how these align and contribute to climate targets, including any trade-offs between their climate and biodiversity targets.<sup>159</sup>

The TNFD guidance emphasises that its impact metrics encompass the mitigation of negative impacts as well as the promotion of positive impacts on nature. Moreover, companies should assess and disclose negative and positive impacts separately from one another rather than on a 'net' basis to promote transparency.<sup>160</sup>

There are further information requirements on:

- the company's interactions with certain ecosystems;
- how they locate their sources of value from ecosystems (promoting transparency and traceability, to understand location-specific dependencies and impacts on nature and communities); and
- how metrics cover the supply chain (and if appropriate the entire value chain).

The TNFD's commentary on the voluntary use of its "LEAP"<sup>161</sup> assessment to inform disclosure, strategy, governance, capital allocation and risk management indicates that it expects disclosures not to be just a tick box exercise but integrated within company strategy and governance.<sup>162</sup> This is underscored by its release of a discussion paper on a proposed approach to scenario analysis, which recommends that in order to manage nature-related risks and opportunities effectively, companies should assess how they may evolve in the future, including through integrated climate-nature scenarios analysis.<sup>163</sup> This guidance could be helpful to directors in fulfilling the risk governance elements of their duties.

Companies disclosing in accordance with the TNFD framework may also have to consider human rights aspects of their interactions with nature. The TNFD recognises that a company's dependencies and impacts on nature link inextricably to society and local communities. Accordingly, it plans to develop its framework further to integrate the societal dimensions of DIRO. One of the new disclosure recommendations under the 'Risk and Impact Management' pillar relates to how the company has engaged stakeholders. The next beta version will provide further guidance and is likely to reference the UN Guiding Principles on Business and Human Rights and the OECD Guidelines for Multinational Enterprises. The final TNFD framework may include human rights policy, human rights due diligence, mitigation of adverse impacts and the principles of 'Free, Prior and Informed Consent' in relation to nature-related decisions.<sup>164</sup>

When considering any future societal aspects of the TNFD framework and the trade-offs between climate and nature targets, directors may need a sophisticated understanding of the interplay between their company's climate, nature and social impacts and targets and what this means for risk governance and discharge of their duties of care and loyalty.

<sup>159</sup> TNFD, [Disclosure Recommendations Appendix 4168](#) (November 2022).

<sup>160</sup> TNFD, [The TNFD Nature-Related Risk and Opportunity Management and Disclosure Framework Beta v0.3](#) (November 2022).

<sup>161</sup> Locate interface with nature. Evaluate dependencies and impacts. Assess risks and opportunities. Prepare to respond to risks and opportunities, and report to investors.

<sup>162</sup> TNFD, [The TNFD Nature-Related Risk and Opportunity Management and Disclosure Framework Beta v0.1](#) (March 2022) 11; TNFD, [The TNFD Nature-Related Risk and Opportunity Management and Disclosure Framework Beta v0.2](#) (June 2022) 30.

<sup>163</sup> TNFD, [The TNFD's proposed approach to scenario analysis](#) (November 2022).

<sup>164</sup> TNFD, [Societal dimensions of nature-related risk management and disclosure – Considerations for the TNFD framework](#) (November 2022).

**What does this mean for companies and their boards?** As above, if the law or investors require disclosure of biodiversity dependencies and impacts, this request may elevate the duties of directors at the disclosing company to govern those dependencies and impacts. The TNFD seems to advocate governance as well as disclosure. It recommends disclosing the company's *processes* to identify, assess and manage its disclosed matters and integration of such processes into risk management. Failure to adapt to transition-related regulations and market norms such as the TNFD could create potential reputational and legal risks to the company. Such risks are certainly permitted, and may be required, to be governed and disclosed.

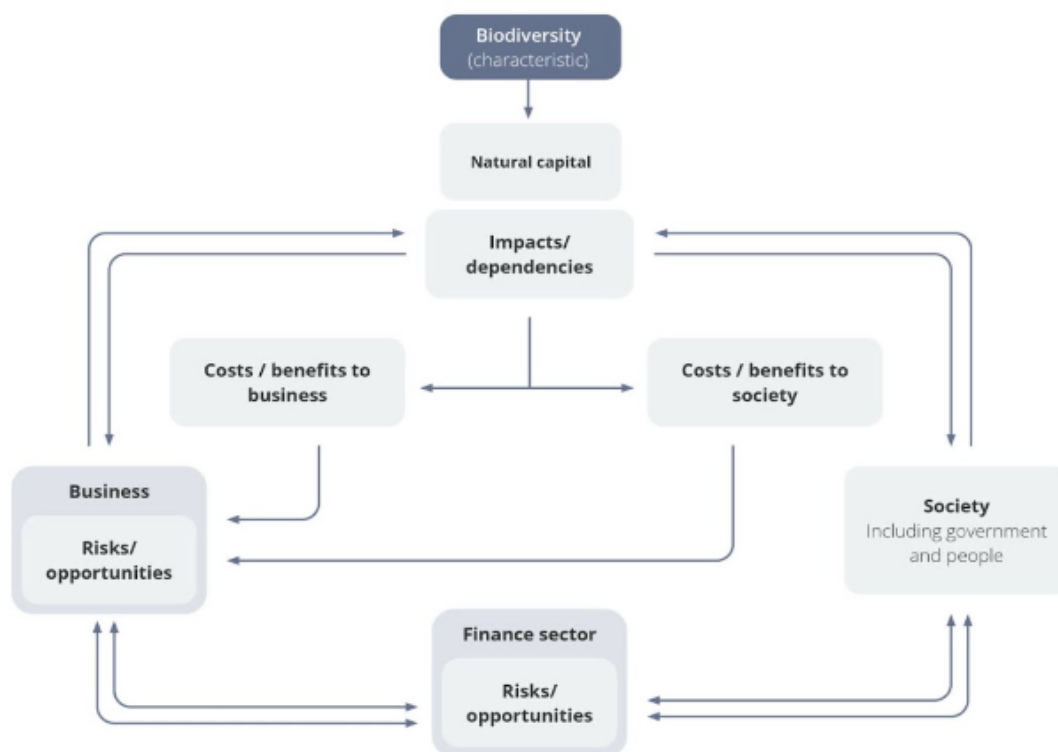
In advance of the TNFD becoming widely accepted or legally required, the law on directors' duties may not strictly require companies to govern and disclose their biodiversity impacts that do not pose any foreseeable or material risk to the company. (Although this is certainly permissible as part of performance of directors' duties). The company's circumstances, views of its investors and interpretation of company law duties in its home jurisdiction will influence the materiality of such impacts to be governed and disclosed. As mentioned above (see section 2), in some jurisdictions the directors' duties of loyalty include having regard to the interests of the environment as a stakeholder. Directors will need to use their discretion and judgement to comply with evolving obligations.

Considering and managing all of a company's impacts could be in the best interest of the company in the long term as part of strategic oversight. This is regardless of their influence on the short-term value of the company or material risks to the company. Shrewd directors with a keen eye for future trends may be able to identify opportunities arising from the company's biodiversity impacts which will increase the company's long-term viability, in the context of the inevitable transition to a nature-positive economy. The TNFD's amended definitions of nature-related risks and opportunities illustrate that biodiversity impacts of companies can pose risks and opportunities in their own right. The definitions include risks posed to wider society and opportunities to create positive outcomes for nature as well as mitigating negative impacts. This focus is underscored by references to "*changing societal landscape*" and "*the capacity of nature to provide social functions*" in the definitions of transition risks and impacts respectively. This indicates that transition risk is shaped by the perspectives of society and that it is not only the economic, but the social repercussions of impacts that are relevant.<sup>165</sup> The TNFD's approach promotes transparency, management of entire value chain dependencies and impacts and places society's targets for nature alongside business and financial interests. It firmly introduces a responsibility for companies to mitigate negative impacts and contribute to restoration of nature. Developments in the financial sector that recognise the value of natural capital (see section 3.6) suggest emerging opportunities for companies to invest in biodiversity-positive solutions within their value chains.

If TNFD-aligned disclosure becomes a market norm, this development may affect companies in certain jurisdictions and sectors, even if those companies do not disclose. Therefore, in anticipation of regulations or investors requiring TNFD-aligned disclosure, prudent directors may decide that their company will start assessing biodiversity dependencies, impacts, risks and opportunities in preparation. In order to have a thorough regard to the company's long-term success, this evaluation should include all of their company's biodiversity impacts regardless of whether they pose a foreseeable or material risk to the company. The law permits this and may require it.

<sup>165</sup> TNFD, [The TNFD Nature-Related Risk and Opportunity Management and Disclosure Framework Beta v0.3](#) (November 2022) 43, 44; TNFD, [Societal dimensions of nature-related risk management and disclosure – Considerations for the TNFD framework](#) (November 2022) 20.

**Figure 5: Relationships among business dependencies & impacts and financial risks & opportunities**



Source: TNFD: Understanding nature: How nature affects financial risk and company and investor performance <sup>166</sup>

### 4.3 Summary: biodiversity specific considerations for governance and disclosure

If a company's dependencies and impacts on biodiversity relate to the same set of ecosystem services, the risks and opportunities arising from the company's dependencies and impacts (subject to scale and severity) are potentially foreseeable and material to its business. This consideration is relevant both in terms of risk governance to discharge directors' duties of care and loyalty and under any disclosure or reporting frameworks that the company complies with.

It is also possible that some impacts of the company unrelated to its dependencies may create foreseeable and material biodiversity risks and opportunities to the company that need to be managed (and, where relevant, disclosed) for the same reasons.

With regards to a company's biodiversity impacts that do not create any foreseeable and material risks or opportunities to the company (either because they are too small to be significant to investors or because they are unlikely to affect the company at all) the position is still evolving. The TNFD framework will require companies that disclose in accordance with its recommendations to govern and disclose these impacts. For other companies this is a grey area that will evolve over time, including in relation to the Post-2020 Global Biodiversity Framework and its Target 15.

**What does this mean for companies and their boards?** It is likely that directors will need to have some awareness of all of the company's dependencies and impacts. This will enable them to make the foreseeability and materiality evaluations necessary to fulfil their duties of care and loyalty, identify the relevant biodiversity risks and opportunities and to understand where they will need to seek expert advice.

<sup>166</sup> Taskforce on Nature-related Financial Disclosures, [Understanding Nature: How nature affects financial risk and company and investor performance](#) (last accessed 10 November 2022); Adapted from: Capitals Coalition, [Finance Sector Supplement](#) (2018).

## Questions for directors

Having identified that biodiversity loss may pose foreseeable and material risks to companies, and that failing to address these risks could incur costs to a company and threats to its long-term reputation, value and viability, what now? Figure 6 outlines some of the questions about biodiversity governance that boards could consider in their oversight of:

- A) biodiversity dependencies, impacts, risks and opportunities;
- B) management of company exposures to biodiversity risk;

in order to discharge their duties of care and loyalty.

**Figure 6: Decision-useful questions for directors: how biodiversity risks and opportunities might affect corporate governance practices.**

- Do I have the appropriate skills and information on how biodiversity issues could affect my company to discharge my governance and disclosure roles on biodiversity?<sup>167</sup>
- What training or information would help me to build my capacity, the capacity of the other directors and of relevant company executives and staff?
- Is the management team assessing the company's foreseeable dependencies and impacts on biodiversity?
- Is the management team measuring the company's material dependencies and impacts on biodiversity and disclosing them in corporate reports? If not, do we have a plan for them to do this?<sup>168</sup>
- Who is responsible in my company for:
  - i. following the development of the TNFD and ISSB frameworks;
  - ii. building the company's expertise and readiness to implement TNFD and ISSB guidance, including in relation to scenario analysis;
  - iii. following other companies' reporting practices; and
  - iv. joining networks of peers that enable shared learning?
- Does my company have a corporate-level strategic biodiversity plan, based on identified dependencies and impacts specific to the company?
- Does our plan enable the company to:
  - i. identify the species, habitats, ecosystems and ecosystem services the company can focus on;
  - ii. define a vision, measurable goals, objectives and strategies to address biodiversity, consistent with overall company strategy, and, where appropriate, help demonstrate its contribution to international biodiversity goals;
  - iii. identify a suite of core biodiversity indicators that will facilitate data aggregation, allowing the company to assess, report and communicate its biodiversity performance;

<sup>167</sup> The CCLI's corporate governance primer may suggest some questions which boards could ask to help answer this question: CCLI, [The climate risk reporting journey: a corporate governance primer](#) (2018)

<sup>168</sup> See the tools listed at Science Based Targets for Nature (SBTN), [Initial Guidance for Business](#) (2020) 25. See also ENCORE, [Exploring Natural Capital Opportunities, Risks and Exposure](#) (last accessed 10 November 2022); Capitals Coalition and Cambridge Conservation Initiative, [Integrating biodiversity into natural capital assessments](#) (2020); [Natural Capital Coalition, Natural Capital Protocol](#) (2016); and Cambridge Institute for Sustainability Leadership Natural Capital Impact Group, [Measuring business impacts on nature: A framework to support better stewardship of biodiversity in global supply chains](#) (2020).

- iv. develop and use maps and dashboards to visualise information and facilitate data-driven decision-making, mainstreaming biodiversity data into corporate reporting and adaptive management; and
- v. analyse data, learn lessons and adapt by reviewing priorities and goals?<sup>169</sup>
- Has, or could, my company set interim science-based targets for nature?<sup>170</sup>
- Are the interim targets for nature aligned with the Science Based Targets for Nature framework beginning in 2023?<sup>171</sup>
- Does our board appropriately consider how the company's targets, risks and policies relating to biodiversity, climate and human rights interrelate, to anticipate potential trade-offs and conflicts? To what extent are these considerations embedded within risk management processes?
- Should my company consider implementing an Environmental Profit & Loss account to internalise biodiversity and embed valuation of natural capital, to make it easier to account for biodiversity in decisions?<sup>172</sup>
- How could my company apply the expertise and resources from climate-related governance and disclosure to biodiversity issues (recognising the differences between the two)? In particular, how could my company apply the broad principles and recommendations laid out in the WEF's *"How to Set Up Effective Climate Governance on Corporate Boards"* to biodiversity, including board representation or external advice to assist directors to consider biodiversity risks and opportunities and comply with their duties?<sup>173</sup>
- Should my company consider reviewing its lobbying, trade association memberships and policy positions in relation to the specificities of biodiversity, guided by the indicators in the Global Standard for Responsible Climate Lobbying (as applied to biodiversity instead of climate)?<sup>174</sup>

<sup>169</sup> IUCN Global Business and Biodiversity Programme, [Guidelines for planning and monitoring corporate biodiversity performance](#) (2021); Cambridge Institute for Sustainability Leadership (CISL), [Developing a Corporate Biodiversity Strategy](#) (2020).

<sup>170</sup> Science Based Targets for Nature, [Initial Guidance for Business](#) (2020); Science Based Targets for Nature, [Interim Targets](#) (last accessed 10 November 2022).

<sup>171</sup> The Science Based Targets for Nature will align targets with the Post-2020 Global Biodiversity Framework after COP15. Science Based Targets for Nature, [Technical Guidance for Step 1: Assess and Step 2: Prioritise: Draft for Public Comment](#) (September 2022); SBTN, [Technical Guidance for Step 3: Measure, Set & Disclose - Initial Freshwater SBTs: Draft for Public Comment](#) (September 2022); SBTN, [Who, what and why? Q&A on science-based targets for nature](#) (September 2022).

<sup>172</sup> Kering, [Universal Registration Document Annual Financial Report - Integrated Report](#) (2021) 278; Kering, [Environmental Profit & Loss \(EP&L\) 2021 Group Results](#) (2021); Puma, [Puma And PPR Home Announce First Results Of Unprecedented Environmental Profit & Loss Account](#) (2011); Puma, [Annual Report](#) (2021); Kering, [What is an EP&L ?](#) (2022); Cambridge Institute for Sustainability Leadership, [Biodiversity and ecosystem services in environmental profit & loss accounts](#) (2016); Cambridge Institute for Sustainability Leadership, Kering and The Natural Capital Project, [Biodiversity and ecosystem services in corporate natural capital accounting](#) (2016).

<sup>173</sup> World Economic Forum and PwC, [How to Set Up Effective Climate Governance on Corporate Boards](#) (2019).

<sup>174</sup> Global Standard on Responsible Climate Lobbying, [Appendix: The 14 indicators of responsible climate lobbying](#) (2022).





## Jurisdictional Spotlights

**These spotlights are illustrative and do not limit jurisdictional applicability of this paper.**

### *Spotlight: Australia*

Directors' duties codified in the Australian Corporations Act 2001 (Cth) apply concurrently with common law duties. Directors must discharge their duties:

- in good faith and in the best interests of the corporation for proper purpose; and
- with the due care and diligence of a reasonable person in the relevant circumstances.<sup>175</sup>

The directors' report in a company's annual report must include information that shareholders would reasonably require to make an informed assessment of operations, financial position, and prospects, including relevant environmental risks.<sup>176</sup> Environmental and stakeholder perspectives are legitimate considerations in directors' pursuit of the best interests of the company.<sup>177</sup>

Expert opinions have concluded that shifts in market perceptions have elevated the standard of Australian directors' duty of care so as to require consideration, disclosure and action in relation to climate risks.<sup>178</sup>

A nascent shift in market perceptions in relation to biodiversity risk may make biodiversity risk similarly applicable. The Australian Accounting Standards Board issued advice on disclosing emerging risks (predominantly climate-related but which could extend to biodiversity) in financial statements.<sup>179</sup> The Australian Council of Superannuation Investors,<sup>180</sup> the Australian Sustainable Finance Initiative (a consortium of leading Australian financial institutions advised and supported by Australian government and regulators),<sup>181</sup> a former board member of Australian Prudential Regulation Authority (APRA) and the Ethical Stewardship Lead at Australia's largest ethical investment fund<sup>182</sup> have all made statements on biodiversity as a material financial and systemic risk. The Reserve Bank of Australia and APRA are both members of the Network for Greening the Financial System (NGFS).<sup>183</sup> The ASX Corporate Governance Council expects listed companies to disclose material exposure to environmental risks.<sup>184</sup>

In June 2022 Australia had the second-highest level of climate change litigation in the world (124 cases), which may indicate it as a potential leading forum for biodiversity claims.<sup>185</sup> A pending case for judicial review relies

<sup>175</sup> Sections 180-183 and Section 185 of the Corporations Act 2001 (Cth).

<sup>176</sup> Sections 298, 299 and 299A of the Corporations Act 2001 (Cth).

<sup>177</sup> Brett Walker, Gerald Ng, Australian Institute Of Company Directors, [The Content Of Directors' "Best Interest" Duty - Memorandum Of Advice](#) (February 2022).

<sup>178</sup> Noel Hutley SC and Sebastian Hartford-Davis, '[Climate Change and Directors' Duties: Memorandum of Opinion](#)' (October 2016); '[Climate Change and Directors' Duties: Supplementary memorandum of opinion](#)' (March 2019); '[Climate Change and Directors' Duties: Further Supplementary Memorandum of Opinion](#)' (April 2021).

<sup>179</sup> AASB, [Climate-related and other emerging risks disclosures: assessing financial statement materiality using AASB/IASB Practice Statement 2](#) (2019)

<sup>180</sup> The Australian Council of Superannuation Investors urged members to assess the financial risk posed by biodiversity loss: Financial Review, [Investors must assess biodiversity risk: ACSI](#) (23 November 2021); Investor Daily, [Investors urged to consider biodiversity risk](#) (22 November 2021); ACSI, Research Reports, [Biodiversity: unlocking natural capital value for investors](#) (November 2021).

<sup>181</sup> The Australian Sustainable Finance Initiative recognised biodiversity as a material challenge and threat to Australia's financial system and is active in the development of guidance for nature-related financial disclosures: Australian Sustainable Finance Initiative, [Australian Sustainable Finance Roadmap: A plan for aligning Australia's financial system with a sustainable, resilient and prosperous future for all Australians](#) (2020).

<sup>182</sup> Australian Conservation Foundation, Australian Ethical Investments and Pollination, [The nature-based economy: How Australia's prosperity depends on nature](#) (2022) Foreword by Geoff Summerhayes and Amanda Richman 4, 5.

<sup>183</sup> Reserve Bank of Australia, [Network for Greening the Financial System Pledge Joint Statement from the Australian Prudential Regulation Authority and the Reserve Bank of Australia](#) (2021).

<sup>184</sup> Australian Securities Exchange, [Corporate Governance Principles and Recommendations](#) (2019) Recommendation 7.4.

<sup>185</sup> Joana Setzer and Catherine Higham, Grantham Research Institute on Climate Change and the Environment, [Global trends in climate change litigation: 2022 snapshot](#) (June 2022) 9.

on the rights of children and future generations to enjoy and benefit from healthy, functioning river systems.<sup>186</sup> A potential claim has been indicated against ANZ Bank on the grounds that it has a legal obligation to disclose and manage its exposure to biodiversity related risks.<sup>187</sup> Additionally, elevated regulatory scrutiny on 'greenwashing' (being the misrepresentation of an organisation's sustainability credentials or that of its products or services) is currently being observed in relation to climate change-related claims, a trend that can readily be applied to biodiversity-related claims and disclosures.<sup>188</sup>

Australia is recognised as one of the seventeen 'megadiverse' countries in the world, which, although they account solely for 1/10 of the Earth's surface, host at least 70% of its terrestrial biodiversity.<sup>189</sup> Even compared to other megadiverse countries, Australia's biodiversity is both rich and unique: alone, it houses between 7 and 10% of all species on Earth.<sup>190</sup> Australia recognises Indigenous rights and interests in land derived from and requiring continuity of traditional laws and customs.<sup>191</sup> Certain cultural rights of Indigenous Peoples are expressly protected in Australia, including the right to conserve and protect the environment and productive capacity of Indigenous land, territories, waters, coastal seas and other resources.<sup>192</sup> This 'right to culture' is currently being relied upon by a First Nations-led organisation in opposing two mining lease applications.<sup>193</sup>

A Bill introduced to the Western Australia Parliament to recognise and secure the inherent rights of nature did not progress beyond the second reading stage.<sup>194</sup> Nevertheless, an Australian City Council has recognised the 'rights of nature' and incorporated them into its operations and practices.<sup>195</sup>

All of these circumstances may have a bearing on the relevance of biodiversity risks to directors' discharge of their duties. Directors can consider this context when answering the [questions for directors](#).

<sup>186</sup> *Nature Conservation Council of New South Wales v Minister for Water, Property and Housing* (pending), See [Climate Change Laws of the World](#), LSE and Grantham Research Institute for Climate Change and Environment (last accessed 10 November 2022); [Climate Case Chart](#), Sabin Center for Climate Change Law Columbia Law School (last accessed 10 November 2022); Nature Conservation Council, [Water & Climate Court Case](#) (2022).

<sup>187</sup> Financial Review, [ANZ under pressure to reveal biodiversity risk](#) (29 August 2022).

<sup>188</sup> ASIC, [INFO 271 – How to avoid greenwashing when offering or promoting sustainability-related products](#) (2022); [Speech](#) by ACCC Deputy Chair (September 2022).

<sup>189</sup> Iberdrola, *Megadiverse Countries* (2022). Other megadiverse countries are Brazil, China, Colombia, Ecuador, United States, Philippines, India, Indonesia, Madagascar, Malaysia, Mexico, Papua New Guinea, Peru, Democratic Republic of Congo, South Africa and Venezuela.

<sup>190</sup> Convention on Biological Diversity, [Australia - Main Details](#) (last accessed 10 November 2022); Australian Government, Department of Climate Change, Energy, the Environment and the Water, *Numbers of Living Species in Australia and the World - Executive Summary* (September 2022); Australian Government, *Australia state of the Environment 2021*, [Flora and fauna](#) (2021).

<sup>191</sup> Wikipedia, [Native title in Australia](#) (last accessed 10 November 2022); *Mabo v Queensland (No 2)* [1992] HCA 23, (1992) 175 CLR 1 (3 June 1992), High Court of Australia; *Wik Peoples v The State of Queensland* [1996] HCA 40, (1996) 187 CLR 1 (23 December 1996), High Court of Australia; Commonwealth Native Title Act 1993; Native Title Amendment Act 1998; *Western Australia v Ward* [2002] HCA 28, (2002) 213 CLR 1 (8 August 2002), High Court of Australia; *Members of the Yorta Yorta Aboriginal Community v Victoria* [2002] HCA 58, (2002) 214 CLR 422 (12 December 2002), High Court of Australia; see the [Judgment Summary](#); International Comparative Legal Guide, [Environmental, Social, & Governance Law](#) (November 2022); National Native Title Tribunal, [Exactly what is native title?](#) (December 2007).

<sup>192</sup> Human Rights Act 2019 (Qld) s 28. See also Charter of Human Rights and Responsibilities Act 2006 (Vic) s 19(2).

<sup>193</sup> *Waratah Coal Pty Ltd v Youth Verdict Ltd & Ors* File no. MRA050-20 (ML 70454) and EPA051-20 (EPML 00571313).

<sup>194</sup> The Blue Mountains City Council of the Government of New South Wales (2020); [The Rights of Nature and Future Generations Bill 2019](#) of Western Australia. The bill did not progress beyond a second reading; Parliament of Western Australia, [Progress of Bills](#) (last accessed 10 November 2022).

<sup>195</sup> The Blue Mountains City Council of the Government of New South Wales (2020), [Blue Mounts City Council first in Australia to adopt 'Rights of Nature'](#).

### Spotlight: Canada

The federal Canada Business Corporations Act (CBCA) and its sister statutes in the Canadian provinces and territories codify directors' duties of loyalty and care, requiring directors to:

- act honestly and in good faith with a view to pursuing the best interests of the corporation; and
- exercise the care, diligence and skill of a reasonably prudent person in comparable circumstances.<sup>196</sup>

Directors can consider a wide range of factors, including the environment, when acting in the best interests of the corporation.<sup>197</sup> The duty of care may be owed more broadly to other stakeholders and is tested objectively and contextually, considering external socio-economic conditions and the corporation's long-term interests.<sup>198</sup> Public companies must disclose which specific risks are threatening the corporation during the period covered by the financial statement and which risks might reasonably affect its profitability in the future.<sup>199</sup>

Courts and regulators have scrutinised directors' risk management,<sup>200</sup> disclosure breaches anchored in failures to manage risk<sup>201</sup> and environmental risk disclosures.<sup>202</sup> The Court of Appeal for British Columbia noted that "*no industry may claim immunity from [environmental protection's] constraints.*"<sup>203</sup> An opinion by a leading Canadian corporate and securities lawyer<sup>204</sup> concluded that the duties of loyalty and care require consideration of climate risk, citing key jurisprudence in Canadian company law and judicial notice of the risks of climate change.<sup>205</sup> The Supreme Court of Canada refused to strike out a case against a corporation by Eritrean workers based on breaches of customary international law. The court held that it is not plain and obvious that corporations enjoy a blanket exclusion under customary international law from direct liability for violations of obligatory, universal norms of international law or indirect liability for their involvement in complicity offences. Consequently, breaches of customary international law may directly apply to corporations. The reasoning of the court demonstrates progression in judicial thinking on the accountability of global corporations acting in multiple jurisdictions, which could in future extend to their responsibility for biodiversity loss.<sup>206</sup>

Many factors suggest biodiversity risks and opportunities are increasingly material to Canadian stakeholders. Canada was the first industrialised country to sign the UN Convention on Biological Diversity,<sup>207</sup>

<sup>196</sup> Section 122(1) [Canada Business Corporations Act](#), note 24, and its sister provincial and territorial corporations' statutes.

<sup>197</sup> [BCE Inc. v. 1976 Debentureholders](#) [2008] 3 SCR 560 Supreme Court of Canada, paragraph 39 and 40. The fact that directors may consider the environment in discharging their duties is further codified in section 122(1.1)(b) of the [Canada Business Corporations Act](#).

<sup>198</sup> [Peoples Department Stores Inc \(Trustee of\) v Wise](#), 2004 SCC 68, 3 SCR 461, Supreme Court of Canada, paragraph 62 and 64; [BCE Inc. v. 1976 Debentureholders](#) [2008] 3 SCR 560 Supreme Court of Canada, 38 and 44.

<sup>199</sup> [Green v Canadian Imperial Bank of Commerce](#), 2012 ONSC 3637, Superior Court of Justice of Ontario, paragraph 32.

<sup>200</sup> [Standard Trustco Ltd., Re](#), 1992 CarswellOnt 140, 15 OSCB 4322 (OSC), Court of Appeal of Ontario; [Green v Canadian Imperial Bank of Commerce](#), 2012 ONSC 3637, Superior Court of Justice of Ontario, paragraph 421, var'd on other grounds 2014 ONCA 90, appeal ref'd 2015 SCC 60.

<sup>201</sup> [Green v Canadian Imperial Bank of Commerce](#), 2012 ONSC 3637, Superior Court of Justice of Ontario, paragraph 463.

<sup>202</sup> [Drywall Acoustic Lathing and Insulation, Local 675 Pension Fund v Barrick Gold Corporation](#) 2021 ONCA 104, Court of Appeal of Ontario.

<sup>203</sup> [Reference re Environmental Management Act \(British Columbia\)](#), 2019 BCCA 181, Court of Appeal of British Columbia, paragraph 1 aff'd [2020 SCC 1](#), Supreme Court of Canada.

<sup>204</sup> Carol Hansell, Hansell LLP, [Legal Opinion: Putting Climate Change Risk on the Boardroom Table](#) (June 2020).

<sup>205</sup> [Mathur, et al. v Her Majesty the Queen in Right of Ontario](#) 2021 ONSC 1624, Superior Court of Justice of Ontario; [Reference re Greenhouse Gas Pollution Pricing Act](#), 2019 ONCA 544, Court of Appeal of Ontario, paragraph 104; [Reference re Greenhouse Gas Pollution Pricing Act](#), 2019 SKCA 40, Court of Appeal for Saskatchewan; [Reference re Greenhouse Gas Pollution Pricing Act](#), 2020 ABCA 74, Court of Appeal of Alberta, paragraph 1; [References re Greenhouse Gas Pollution Pricing Act](#), 2021 SCC 11, Supreme Court of Canada, paragraph 2; [Syncrude Canada Ltd. v Canada \(Attorney General\)](#), 2014 FC 776, paragraph 83, aff'd, [2016 FCA 160](#); Brenda Powell and Josephine Yam, [Judicial Notice of Climate Change](#) (March 2015).

<sup>206</sup> [Nevsun Resources Ltd. v. Araya](#) 2020 SCC 5, Supreme Court of Canada.

<sup>207</sup> The Conversation, [Environmental laws in Canada fall short of addressing the ongoing biodiversity crisis](#) (24 June 2021).

hosts the ISSB headquarters<sup>208</sup> and is set to introduce mandatory TCFD-aligned disclosure requirements.<sup>209</sup> In 2020, 38% of Canadian issuers' ESG reports discussed biodiversity.<sup>210</sup> The UN Principles for Responsible Investment count 236 Canadian signatories,<sup>211</sup> while both the Bank of Canada and the Canada's Office of the Superintendent of Financial Institutions are members of the Network for Greening the Financial System.<sup>212</sup> Beyond having strong commitments regarding climate disclosure, the Canada Pension Plan Investment Board lists biodiversity as one of the factors redefining environmental risks and opportunities.<sup>213</sup> Lastly, Canada has the fourth highest level of climate change litigation in the world (33 cases).<sup>214</sup> By analogy, Canada has great potential to become a leading forum for future biodiversity-related lawsuits.

Canada's biodiversity richness is related to its geographic size and varied environments, hosting approximately 10% of the world's forest cover and 25% of the world's wetlands.<sup>215</sup> After a history of colonialism, Canada's legal system now recognises aboriginal title and cultural relationship with land (although how this recognition is implemented in specific cases is still a live issue in Canadian courts).<sup>216</sup> Canada has funded Indigenous leadership in conservation<sup>217</sup> and recognised the legal personality and rights of two rivers.<sup>218</sup> While all of these factors point to the importance of biodiversity protection in Canada, the increasing rate of biodiversity loss is a problem still largely unaddressed by Canadian authorities, and consequently a potential risk directors may need to consider. Canada has failed to meet its own biodiversity targets.<sup>219</sup> A report submitted by the Office of the Auditor General of Canada noted the federal government's substantive lack of progress. Only 42% of Canada's at-risk species are in recovery, which is not on track to meet Canada's 2025 goals.<sup>220</sup>

All of these circumstances may have a bearing on the relevance of biodiversity risks to directors' discharge of their duties. Directors can consider this context when answering the [questions for directors](#).

<sup>208</sup> International Comparative Legal Guide, [Environmental, Social, & Governance Law Canada 2022](#) (2022).

<sup>209</sup> Government of Canada, [Budget 2022. Tax Measures: Supplementary Information](#) (April 2022); Prime Minister of Canada, [Minister of Environment and Climate Change Mandate Letter](#) (2021); Canadian Securities Administrators, [CSA Notice and Request for Comment Proposed National Instrument 51-107 Disclosure of Climate-related Matters](#) (October 2021) 6.

<sup>210</sup> Millani, [Millani's 5th Annual ESG Disclosure Study: A Canadian Perspective](#) (September 2021); International Comparative Legal Guide, [Environmental, Social & Governance Law 2022](#) (2022).

<sup>211</sup> Principles for Responsible Investments, [Signatory directory](#) (last accessed 10 November 2022).

<sup>212</sup> Royal Bank of Canada, [Nature and Biodiversity - The Next Frontier of Sustainability](#) (July 2022).

<sup>213</sup> Canada Pension Plan Investments, [2021 Report on Sustainable Investing](#) (2021).

<sup>214</sup> Climate Change Laws of the World, LSE and Grantham Research Institute for Climate Change and the Environment, [Canada](#) (last accessed 10 November 2022); Joana Setzer and Catherine Higham, [Global Trends in climate change litigation: 2022 snapshot](#) (2022).

<sup>215</sup> The Canadian Encyclopedia, [Biodiversity](#) (last accessed 10 November 2021).

<sup>216</sup> *Guerin v The Queen*, [1984] 2 S.C.R. 335, Supreme Court of Canada established that the Crown had a fiduciary duty to protect Aboriginal title for Aboriginal peoples; *Delgamuukw v British Columbia* [1997] 3 S.C.R. 1010, Supreme Court of Canada set out how courts will deal with Aboriginal title; Indigenous Foundations, [Aboriginal Title](#) (2009); Terri-Lynn Williams-Davidson and Janis Serra, CCLI Canada, [Haida law of gina'waadluxan gud ad kwaagiida and Indigenous rights in conservation finance](#) (2021); *Haida Nation v British Columbia (Ministry of Forests)*, 2004 SCC 73 [Haida Nation]; Conservation partnerships with Indigenous peoples have been made in the *Gwaii Haanas Agreement*, *Gwaii Haanas Marine Agreement*, *Great Bear Rainforest (Forest Management) Act* and *Great Bear Rainforest Land User Order*.

<sup>217</sup> Government of Canada, [Government of Canada announces funding for Indigenous communities to protect species at risk and their habitats](#) (June 2022).

<sup>218</sup> Reuters, [Canadian river wins legal rights in global push to protect nature](#) (24 February 2021); United Nations, Harmony With Nature Platform, [Rights of Nature Law and Policy](#) (last accessed 10 November 2022).

<sup>219</sup> CBC News, [Canada, host of the UN biodiversity summit, is struggling to meet its own targets](#) (October 2022) (Last accessed 28 November 2022).

<sup>220</sup> Office of the Auditor General of Canada, [2022 Reports 6 to 10 of the Commissioner of the Environment and Sustainable Development](#) (November 2022)

### Spotlight: India

Indian directors have statutory duties:

- to act in good faith in order to promote the objects of the company for the benefit of its members as a whole, and in the best interests of the company, its employees, the shareholders, the community and for the protection of environment;<sup>221</sup> and
- to exercise due and reasonable care, skill and diligence and independent judgment.<sup>222</sup>

The statute does not recognise any hierarchy between duties owed to the company and to other stakeholders. Acting in the best interest of the environment is therefore obligatory, and not a mere option.<sup>223</sup> The duty of due and reasonable care is likely to involve risk monitoring and oversight.<sup>224</sup> The separate code prescribed for independent directors (required on boards of publicly listed companies) requires independent directors to safeguard the interests of all stakeholders, balance the conflicting interests of the stakeholders and keep themselves well informed about the company and the external environment in which it operates.<sup>225</sup>

Directors of listed companies must adequately identify, monitor and manage environmental risks and disclose material information.<sup>226</sup> Companies with specified turnover have spending and governance obligations on corporate social responsibility: permitted categories of spending include “ensuring environmental sustainability, ecological balance, protection of flora and fauna, animal welfare, agroforestry, conservation of natural resources and maintaining quality of soil, air and water [...]”.<sup>227</sup> The top thousand listed companies (by market capitalisation) must report on environmental performance in a ‘business responsibility and sustainability report’. Obligations include reporting on significant direct and indirect impact on biodiversity in ecologically sensitive areas requiring environmental approvals, prevention and remediation activities, and reporting against nine principles of responsible business conduct, one of which emphasises protection and restoration of the environment.<sup>228</sup>

The Indian government is expected to launch a taxonomy for sustainable finance.<sup>229</sup> The Reserve Bank of India is a member of the NGFS and has cautioned regulated entities to take cognisance of environmental risks and opportunities.<sup>230</sup> The Securities and Exchange Board of India also has a framework for issuance of green debt securities which requires the proceeds of the issue to be used for certain specified cases including sustainable land use and biodiversity conservation.<sup>231</sup> The government is expected to introduce a revised bill amending the Biological Diversity Act 2002 to *inter alia* simplify the compliance requirements for collaborative research and investment, reduce dependence on wild medicinal plants and encourage the cultivation of medicinal plants and promote Indian systems of medicine.<sup>232</sup>

<sup>221</sup> Section 166(2) of the Companies Act of India.

<sup>222</sup> Section 166(3) of the Companies Act of India.

<sup>223</sup> *M.K. Ranjitsinh v Union of India* (2021) SCC Online SC 326, Indian Supreme Court, as discussed in Shyam Divan SC, Ria Singhsawhney and Sugandha Yadav, [Directors' obligations to consider climate change-related risk in India](#) (2021) 13; CCLI, [Primer on Climate Change: Directors' duties and Disclosure Obligations](#) (July 2022) 85.

<sup>224</sup> CCLI, [Primer on Climate Change: Directors' duties and Disclosure Obligations](#) (July 2022) 86.

<sup>225</sup> Section 149 and Schedule IV of the Companies Act of India.

<sup>226</sup> SEBI (Listing Obligations and Disclosure Requirements) Regulations 2015, reg. 4(2)(f), reg. 21, Schedule II, Part D, C, (1)(a); and Schedule III, Part A, para. B (6); SEBI (Issuance of Capital and Disclosure Requirements) Regulations, Schedule VI-A, Para. 11(B)(1)(C)(iv) and para. (5)(B).

<sup>227</sup> Section 135 and Schedule VII of the Companies Act of India, read with the Companies (Corporate Social Responsibility Policy) Rules 2014.

<sup>228</sup> Securities and Exchange Board of India, [Circular no. SEBI/HO/CFD/CMD-2/P/CIR/2021/562 on Business responsibility and sustainability reporting by listed entities](#) (10 May 2021); Ministry of Corporate Affairs, “National Guidelines on the Economic, Social and Environmental Responsibilities of Business (2018).

<sup>229</sup> Institute for Energy Economics & Financial Analysis, [India should aim for a truly green taxonomy to gain global investor buy-in](#) (2022); Ministry of Finance, Government of India, Economic Survey (2021-22), para. 6.62.

<sup>230</sup> Reserve Bank of India, [Discussion Paper on Climate Risk and Sustainable Finance](#) (2022).

<sup>231</sup> Regulation 2(1)(q), SEBI (Issuance and Listing of Non-Convertible Securities) Regulations, 2021.

<sup>232</sup> Biological Diversity (Amendment) Bill, 2021; [Report of the Joint Committee on the Biological Diversity \(Amendment\) Bill, 2021, Lok Sabha Secretariat](#) (August 2022); Also See <https://prsindia.org/billtrack/the-biological-diversity-amendment-bill-2021> (last accessed 15 November 2022).

The Indian Supreme Court has extended the constitutional right to life<sup>233</sup> to protect the environment. By affirming that nature is held by the state in trusteeship for the benefit of the public and of nature itself, the court favoured an ecocentric approach to legal issues.<sup>234</sup> A High Court in India declared two of the longest and most important rivers in India, the Ganges and Yamuna, to be living entities having the status of a legal person. The rivers were granted all corresponding rights, duties and liabilities of a living person.<sup>235</sup> However, the Supreme Court stayed the order. The matter is now pending before the apex court. In the past, Indian courts have also recognised the legal personality of lakes, rivers, mother nature, animals and glaciers.<sup>236</sup> courts in India have also repeatedly adopted the higher standard of absolute liability for companies involved in environmental disasters such as leaks of hazardous substances. Violation of environmental laws can also render directors liable in certain circumstances. India is recognised as a mega-biodiverse country, accounting for 7 - 8% of recorded species on the Earth, while covering only 2.4% of global surface.<sup>237</sup> The Indian government has granted Indigenous Adivasi communities the rights to “conserve or manage any community forest” that they have traditionally occupied and, among other things, to access and use minor forest produce which has been traditionally collected.<sup>238</sup> The Supreme Court recognised the community, cultural and religious rights of Adivasi communities in its decision on bauxite mining in an ecologically sensitive region.<sup>239</sup> In another case, it stayed its ruling evicting Adivasis in light of procedural irregularities with the claims process for their forest land rights under the Forest Rights Act 2006.<sup>240</sup> More recently, the Supreme Court has ruled against the diversion of forest land by state authorities without requisite central government approval.<sup>241</sup>

All of these circumstances may have a bearing on the relevance of biodiversity risks to directors’ discharge of their duties. Directors can consider this context when answering the [questions for directors](#).

<sup>233</sup> Article 21 of the Constitution of India.

<sup>234</sup> *T.N. Godavarman Thirumulpad vs. Union of India and Others* (13 February 2012), Supreme Court of India; *Centre for Environment Law WWF-I v. Union of India* (15 April 2013), Supreme Court of India; ClientEarth, [10 Landmark Cases for biodiversity](#) (September 2021); United Nations, Rights of Nature Platform, [Rights of Nature Law and Policy](#) (last accessed 10 November 2022). The Court relied on the doctrine of public trust as enunciated in *M.C. Mehta v. Kamal Nath and Others* (1997) 1 SCC 388, Supreme Court of India.

<sup>235</sup> *Mohd. Salim v. State of Uttarakhand*, AIR 1959 All 540 (Uttarakhand High Court).

<sup>236</sup> *T.N. Godavarman Thirumulpad vs. Union of India and Others* (13 February 2012), Supreme Court of India; ClientEarth, [10 Landmark Cases for biodiversity](#) (September 2021); United Nations, Harmony with Nature Platform, [Rights of Nature Law and Policy](#) (last accessed 10 November 2022).

<sup>237</sup> International Union for Conservation of Nature, [Asia: Countries: India](#) (last accessed 10 November 2022).

<sup>238</sup> Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act 2006.

<sup>239</sup> *Orissa Mining Corporation v. Ministry of Environment and Forests* (18 April 2013), Supreme Court of India; The Guardian, [Vedanta mine plan halted by Indian government](#) (24 August 2010); Business & Human Rights Resources Centre, [India: Landmark Supreme Court ruling a great victory for Indigenous rights](#) (18 April 2013).

<sup>240</sup> *Wildlife First v. Union of India* (28 February 2019), Supreme Court of India.

<sup>241</sup> *Narinder Singh v. Divesh Bhutani* (July 21, 2022), Supreme Court of India; Jayashree Nandi, [SC on Aravallis: Judgment will have implications across country](#), the Hindu (July 22, 2022).

### Spotlight: South Africa

The general duties of South African directors include:

- fiduciary duties of acting in the best interests, good faith and proper purpose; and
- the duty to act with care, skill and diligence (i.e., reasonably expected competence).<sup>242</sup>

These duties are owed to the company, including the shareholders as a whole.<sup>243</sup> Directors can primarily be held liable by the relevant company. Only in limited circumstances shareholders and stakeholders may file a claim against directors for the losses they suffered. Shareholders could also, through derivative actions, force a company to act against its directors for breach of duties.<sup>244</sup>

There is no “closed list” of fiduciary duties. According to the King IV Report on Corporate Governance for South Africa 2016 (**King IV**), the ambit of directors’ duties can evolve in response to relevant circumstances,<sup>245</sup> societal values and industry norms.<sup>246</sup> King IV is mandatory in certain respects only for listed companies and recommended for all companies. King IV links value creation to natural capital as one of the six categories of capital. In fulfilling their fiduciary duties and duty of care, directors must additionally ensure that the company is a responsible corporate citizen and that it monitors its activities in relation to biodiversity, with other risks. King IV’s definitions of good governance, reporting and risk management refer to *the triple context* (economy, society and environment) and the company’s uses of and effects on nature.<sup>247</sup>

Another ‘game-changing’ factor in interpreting fiduciary duties is the Constitution, together with the Bill of Rights.<sup>248</sup> Courts are required to promote the spirit, purport, and objects of the Bill of Rights,<sup>249</sup> which includes the right “to have the environment protected for the benefit of present and future generations” through reasonable legislative and other measures that “(i) prevent pollution and ecological degradation; (ii) promote conservation and (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development”. A company’s ‘best interests’, if interpreted to promote the Bill of Rights, may reasonably extend to embrace environmentally responsible board decisions.<sup>250</sup>

The National Environmental Management Act, 1998 (**NEMA**) imposes an overarching and far-reaching statutory duty of care on directors to take reasonable measures to prevent, minimise and rectify significant pollution and environmental degradation. Reasonable measures could include, for example, to ensure that the board:<sup>251</sup>

<sup>242</sup> Companies Act 71 of 2008; Christine Reddell, CCLI, [Directors’ Liability and Climate Risk: South Africa - Country Paper](#) (April 2018).

<sup>243</sup> Farouk Cassim et al., *Contemporary Company Law*, 2nd edition, Juta, Claremont (South Africa), 2012, 515.

<sup>244</sup> Hlumisa Investment Holdings (RF) Ltd and Another v Kirkinis and Others (1423/2018) [2020] ZASCA 83 (3 July 2020); De Bruyn v Steinhoff International Holdings N.V. (2920/2018) [2020] ZAGPJHC 145. Although section 218(2) of the Companies Act provides that: “[a]ny person who contravenes any provision of this Act is liable to any other person for any loss or damage suffered by that person as a result of that contravention”, the courts in South Africa have held that if a company has a claim, other shareholders or stakeholders cannot institute a claim, except in limited circumstances.

<sup>245</sup> *Volvo (Southern Africa) (Pty) Ltd v Yssel* (247/08) [2009] ZASCA 82; 2009 (6) SA 531 (SCA); [2009] 4 All SA 497 (SCA); [2010] 2 BLLR 128 (SCA), paragraph 16; Christine Reddell, CCLI, [Directors’ Liability and Climate Risk: South Africa - Country Paper](#) (2018); *Ghersis v Tiber Developments (Pty) Ltd* 2007 (4) SA 536 (SCA) paragraph 9 (quoting *Phillips v Fieldstone Africa (Pty) Ltd and Another* 2004 (3) SA 465 (SAC) 477H).

<sup>246</sup> Christine Reddell, CCLI, [Directors’ Liability and Climate Risk: South Africa - Country Paper](#) (April 2018).

<sup>247</sup> Institute of Directors in South Africa and King Committee on Corporate Governance, [King Report on Corporate Governance for South Africa 2016](#) (2016).

<sup>248</sup> Christine Reddell, CCLI, [Directors’ Liability and Climate Risk: South Africa - Country Paper](#) (April 2018); Minal Ramnath, *Interpreting Directors’ Fiduciary Duty to Act in the Company’s Best Interests Through the Prism of the Bill of Rights: Taking Other Stakeholders into Consideration* (2013) 27(2) *Speculum Juris*. Also see: Section 8(2) and 39(2) of the Constitution of the Republic of South Africa 1996.

<sup>249</sup> Section 39(2) of the Constitution of the Republic of South Africa 1996.

<sup>250</sup> Christine Reddell, CCLI, [Directors’ Liability and Climate Risk: South Africa - Country Paper](#) (2018); Minal Ramnath, *Interpreting Directors’ Fiduciary Duty to Act in the Company’s Best Interests Through the Prism of the Bill of Rights: Taking Other Stakeholders into Consideration* (2013) 27(2) *Speculum Juris*.

<sup>251</sup> National Environmental Management Act sections 28(1), (2) and (3)



- has a comprehensive ESG strategy and continuously analyses ESG related risks;
- appoints a technical director to assess issues of a technical nature, and establishes reporting lines to report environmental issues to the technical director;
- provides the necessary resources (financial and human capital) to drive a culture of environmental compliance;
- holds employees responsible for breaches of environmental policies and procedures; and
- keeps proper records of all discussions at board meetings and minutes of decisions and resolutions.

NEMA empowers regulators to issue directives against director(s) who have breached their duty of care, directing them to cease any activity, operation or undertaking, investigate, evaluate, and assess the impact of specific activities and report thereon, or implement specific measures to remediate pollution or degradation.<sup>252</sup> To the extent that directors fail to comply or inadequately comply with a directive, NEMA empowers the relevant authorities to implement reasonable measures to remedy the pollution and recover the related costs from directors.<sup>253</sup>

NEMA provides for directors' joint and several liability for negative environmental impacts, whether advertently or inadvertently caused by the company or close corporation which they represent. Directors' liability includes damage, degradation or pollution of the environment.<sup>254</sup> This is a form of strict liability which does not require proof of intention or negligence on the director's side.

NEMA also provides that any person who is or was a director at the time of the commission of certain offences by the company, including the failure to comply with the duty of care provisions, shall themselves be guilty of the said offence.<sup>255</sup> Any person, in the public interest or in the interest of the protection of the environment, can institute prosecution proceedings under NEMA in respect of any breach or threatened breach of any duty concerned with the protection of the environment, if breach of that duty is an offence under NEMA.<sup>256</sup> A third party therefore has the right to institute criminal proceedings against companies and their boards that breach their statutory duties of care.

From a commercial perspective, stewardship and responsible investment have become key components of South African governance.<sup>257</sup> South Africa's financial sector has a newly adopted and robust Green Finance Taxonomy,<sup>258</sup> a long history of pro-ESG initiatives<sup>259</sup> and has been a "leader and an innovator in integrating ESG issues."<sup>260</sup> The stock exchange operated by the JSE Limited includes biodiversity indicators and applies 'impact' or 'double' materiality in its guidance for narrative disclosures.<sup>261</sup> Financial institutions in South Africa have been found to have significant exposure to nature-related risk.<sup>262</sup>

South Africa is also one of the most biologically diverse countries in the world due to species and ecosystem diversity and rate of endemism.<sup>263</sup> The importance of biodiversity has recently been formally recognised in South Africa's first draft White Paper on the Conservation and Sustainable Use of Biodiversity, which anticipates forthcoming laws and amendments to existing laws to conserve and sustainably use biodiversity.

<sup>252</sup> National Environmental Management Act section 28(4)

<sup>253</sup> National Environmental Management Act sections 28(7) and (8)

<sup>254</sup> National Environmental Management Act section 24N (8)

<sup>255</sup> National Environmental Management Act section 34(7)

<sup>256</sup> National Environmental Management Act section 33

<sup>257</sup> CRISA Committee, [Second Code for Responsible Investment in South Africa: "CRISA 2"](#) (2022); International Comparative Legal Guides and Bowmans, [Environmental, Social and Governance Law, South Africa](#) (2021).

<sup>258</sup> National Treasury, Republic of South Africa, [South African Green Finance Taxonomy](#) (2022).

<sup>259</sup> PRI, [South Africa Roadmap](#) (2017).

<sup>260</sup> UNEP, [Experience and Lessons from South Africa](#) (2016); ICLG and Bowmans, [Environmental, Social and Governance Law, South Africa](#) (2021); CISL, [Embedding environmental scenario analysis into routine financial decision-making in South Africa](#) (2018).

<sup>261</sup> Johannesburg Stock Exchange, [Sustainability and Climate Disclosure Guidance](#) (2022).

<sup>262</sup> FSD Africa and Vivid Economics by McKinsey, [Nature and financial institutions in Africa: A first assessment of opportunities and risks](#) (2022).

<sup>263</sup> Convention on Biological Diversity, [South Africa - Main Details](#) (last accessed 10 November 2022).

The White Paper highlights the importance of recognising the rights of local and indigenous communities and the key role of indigenous knowledge in this regard.<sup>264</sup> Courts have also emphasised the importance of public participation and meaningful consultation with affected stakeholders, and in some instances of informed consent, where Indigenous communities' rights are impacted by proposed developments. Courts have, for example, upheld Indigenous communities' rights of consultation in relation to seismic ocean exploration<sup>265</sup> and mining of land.<sup>266</sup>

All of these circumstances may have a bearing on the relevance of biodiversity risks to directors' discharge of their duties. Directors can consider this context when answering the [questions for directors](#).

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<sup>264</sup> South Africa Department of Forestry, Fisheries and the Environment, [White Paper on the Conservation and Sustainable Use of Biodiversity](#) (July 2022)

<sup>265</sup> [Sustaining the Wild Coast NPC and Others v Minister of Mineral Resources and Energy and Others](#) (3491/2021) [2022] ZAECMKHC 55, High Court of South Africa.

<sup>266</sup> [Maledu and Others v Itereleng Bakgatla Mineral Resources \(Pty\) Limited and Another](#) (CCT265/17) [2018] ZACC 41; 2019 (1) BCLR 53 (CC); 2019 (2) SA 1 (CC) (25 October 2018), Constitutional Court of South Africa; [Baleni and Others v Minister of Mineral Resources and Others](#) (73768/2016) [2018] ZAGPPHC 829; [2019] 1 All SA 358 (GP); 2019 (2) SA 453 (GP) (22 November 2018), North Gauteng High Court, Pretoria, South Africa; iAfrica, [Traditional and Khoi-San Leadership Act Threatens Rights Over Communal Land](#) (2019).

### Spotlight: United Kingdom

The Companies Act 2006 codified English common law directors' duties.<sup>267</sup> The most relevant<sup>268</sup> duties are:

- the duty to promote the success of the company for the benefit of its members as a whole (section 172, which is consistent with the common law duty of loyalty<sup>269</sup>), and
- the duty to exercise reasonable care, skill, and diligence (section 174, sometimes referred to as the duty of competence), which is not strictly fiduciary in nature.<sup>270</sup>

Directors are required to "have regard" on a discretionary basis<sup>271</sup> to a non-exhaustive list of factors including the environment,<sup>272</sup> to ensure that directors consider the company's long-term success (i.e. 'enlightened shareholder value').<sup>273</sup> These factors are subordinate to promoting the success of the company and directors cannot be forced to give them specific weight. Notwithstanding, directors of large companies must report annually how they have had regard to this list of factors.<sup>274</sup> Developments in corporate reporting and disclosure requirements can affect interpretation of how directors have complied with their general duties, including their duty to promote the success of the company. They could therefore bring analysis of biodiversity risk within reasonable corporate governance practices.<sup>275</sup> Directors have various reporting and disclosure obligations (varying in accordance with size, legal status and type of company) in relation to material risks to and performance of the company including in relation to environmental matters.<sup>276</sup> According to the UK Corporate Governance Code, risks to be managed include those that may threaten the business model, future performance, solvency or reputation.<sup>277</sup>

The UK government commissioned the ground-breaking Dasgupta Review on The Economics of Biodiversity,<sup>278</sup> endorsed and committed to addressing its findings, including by incorporating nature into national accounts, policy and finance frameworks and funding the TNFD framework.<sup>279</sup> The proposed incorporation of ISSB standards into the new UK Sustainability Disclosures Requirement regime may include biodiversity-related disclosures.<sup>280</sup> Biodiversity risk has been acknowledged by the Bank of England<sup>281</sup>, the

<sup>267</sup> Sections 171-177 of the UK Companies Act 2006.

<sup>268</sup> The other five statutory fiduciary duties align with the central duty to promote the success of the company. CCLI, [Directors' Liability and Climate Risk: United Kingdom - Country Paper](#) (2018) 10.

<sup>269</sup> Section 172 of the Companies Act 2006. Rosemary T. Langford, [The Duty of Directors to Act Bona Fide in the Interests of the Company: A Positive Fiduciary Duty? Australia and the UK Compared](#) (2011) 11(1) *Journal of Corporate Law Studies* 215, 234.

<sup>270</sup> *Maidment v Attwood & Ors* [2012] EWCA Civ 998, paragraph 22.

<sup>271</sup> Andrew Keay and Taskin Iqbal, [The Impact of Enlightened Shareholder Value](#) (2019) 5; *Cobden Investments Ltd v RWM Langport Ltd* [2008] EWHC 2810 (Ch); *Re West Coast Capital (LIOS) Ltd* [2008] CSOH 72, 2008 Scot (D) 16/5; Department of Business, Energy and Industrial Strategy, Corporate Governance Report (November 2016); Georgina Tsagas, [Section 172 of the UK Companies Act 2006: Desperate Times Call for Soft Law Measures](#) (September 2017); *R (on the application of People & Planet) v HM Treasury* [2009] EWHC 3020 Admin; Katrina Muscat, Shareholder Primacy Over Planetary Security: How the Companies Act 2006 Fails to Bring About Corporate Action in the Face of Climate Change (2020) 5(1) *Durham Law Review* 19.

<sup>272</sup> Section 172(1) and 172(1)(d) of the Companies Act 2006

<sup>273</sup> James Barabas and Sara Trapani, Changes to English Company Law: Directors' Duties (2008) 22(2) *The Corporate & Securities Law Advisor* 1. See the Company Law Review Steering Group, *Modern Company Law for a Competitive Economy: Strategic Framework*, 1999, London, Department of Trade and Industry, paragraph 5.1.12. *Shepherd v Williamson* [2010] EWHC 2375 (Ch); Mihir Naniwadekar and Umakanth Varottil, 'The Stakeholder Approach Towards Directors' Duties Under Indian Company Law: A Comparative Analysis' (2016) NUS Working Paper 2016/006 and NUS Centre for Law & Business Working Paper 1603, 2.

<sup>274</sup> Section 414CZA (1) of the Companies Act 2006.

<sup>275</sup> Lisa Benjamin, The Duty of Due Consideration in the Anthropocene: Climate Risk and English Directorial Duties (2017) 11(2) *Carbon & Climate Law Review*, 90.

<sup>276</sup> Sections 414A, 414(C), 414C (7), 414CB(A1), 414CB(2)(d), 414CB(2)(e), (2A) (3) of the Companies Act 2006.

<sup>277</sup> Financial Reporting Council, [UK Corporate Governance Code](#) (2018), 12, section 4, principle O.

<sup>278</sup> Partha Dasgupta [The Economics of Biodiversity: The Dasgupta Review](#) (2021) .

<sup>279</sup> HM Treasury, [The Economics of Biodiversity: The Dasgupta Review Government response](#) (2021).

<sup>280</sup> HM Treasury, [Greening Finance: A Roadmap to Sustainable Investing](#) (October 2021).

<sup>281</sup> Bank of England, [Climate-related financial disclosure](#) (2022).

UK Financial Conduct Authority,<sup>282</sup> the UK Pensions Regulator,<sup>283</sup> the British Institute and the Faculty of Actuaries.<sup>284</sup> The Financial Reporting Council listed biodiversity as an increasingly prominent theme for investors.<sup>285</sup>

The UK has the third highest level of climate litigation in the world (83 cases).<sup>286</sup> UK courts have accepted jurisdiction in cases relating to environmental damage caused by companies or their subsidiaries in other jurisdictions, including Zambia, Nigeria and Brazil.<sup>287</sup> Although untested in court, there is a potential that biodiversity actions could be brought by investors under section 90A of the Financial Services and Markets Act 2000 on the basis of untrue or misleading statements.<sup>288</sup> Shareholder action in the UK by ShareAction, Climate Action 100+ and Follow This includes climate resolutions proposed at BP's 2019 Annual General Meeting.<sup>289</sup> The UK Advertising Standards Agency launched guidance on misleading environmental claims and has taken actions against HSBC, Tesco, Oatly, Ryanair, Shell, Hyundai, Alpro and Innocent.<sup>290</sup> The Law Society of England and Wales published two horizon scanning reports considering the possibility of rights of nature.<sup>291</sup> The UK company Faith in Nature appointed a director to represent nature on its board.<sup>292</sup>

All of these circumstances may have a bearing on the relevance of biodiversity risks to directors' discharge of their duties. Directors can consider this context when answering the [questions for directors](#).

<sup>282</sup> Financial Conduct Authority, [A strategy for positive change: our ESG priorities](#) (2021) (last accessed 10 November 2022).

<sup>283</sup> Responsible Investor, [UK pensions regulator 'keeping very close tabs' on TNFD disclosure](#) (26 August 2022); The Pensions Regulator, [Climate Change Strategy](#) (April 2021).

<sup>284</sup> Aled Jones et al., [The importance of biodiversity risks](#) (2022) 27(e9) British Actuarial Journal.

<sup>285</sup> Financial Reporting Council, [The influence of the UK Stewardship Code 2020 on practice and reporting](#) (2022).

<sup>286</sup> Joana Setzer and Catherine Higham, LSE and Grantham Research Institute for Climate Change and the Environment, [Global trends in climate change litigation: 2022 snapshot](#) (2022); International Comparative Legal Guides, [Environmental, Social, & Governance Law UK 2022](#) (2022).

<sup>287</sup> [Lungowe v Vedanta Resources plc](#) [2019] UKSC 20; [Okpabi and others v Royal Dutch Shell Plc and another](#) [2021] UKSC 3; [Municipio de Mariana v. BHP Group \(UK\) Lrd and Another](#) [2022] EWCA Civ 951.

<sup>288</sup> Section 90A of the [Financial Services and Markets Act 2000](#).

<sup>289</sup> BP, [Notice of Meeting](#) (12 May 2022).

<sup>290</sup> ASA, Advertising Guidance - misleading environmental claims and social responsibility (6 June 2022); Investment Week [HSBC set to be accused of greenwashing by Advertising Standards Authority - reports](#) (29 April 2022); ASA, [Ruling on Oatly UK Ltd t/a Oatly](#) (January 2022); Walker Morris, [The crackdown on greenwashing continues: ASA's ruling that Tesco's advert regarding plant-based burger was misleading](#) (9 June 2022); ASA, [ASA Ruling on Shell UK Ltd](#) (July 2020); ASA, [ASA Ruling on Ryanair Ltd t/a Ryanair Ltd](#) (February 2020); ASA, [ASA Ruling on Hyundai Motor UK Ltd](#) (June 2021).

<sup>291</sup> The Law Society, [Law in the emerging bio-age](#) (2022); The Law Society, [How biodiversity loss could disrupt businesses in the next 10 years](#) (2022).

<sup>292</sup> The Guardian, [Eco beauty company 'appoints nature' to its board of directors](#) (22 September 2022).



## Appendix 1 - Biodiversity risk: a material financial risk

There is international consensus, including from the Network for Greening the Financial System (**NGFS**), the UN Principles for Responsible Investment (**PRI**), the Task Force on Nature-related Financial Disclosures (**TNFD**), the World Economic Forum (**WEF**), the Organisation for Economic Co-operation and Development (**OECD**), governments and national central banks, that biodiversity is a systemic and financial risk, material to a number of sectors.<sup>293</sup> This Appendix examines how biodiversity risk may constitute a material financial risk, both to individual companies and to the wider economic and financial systems. It explains how:

- A) the global economy is dependent on ecosystems;
- B) how biodiversity underpins these ecosystems;
- C) how the loss of such biodiversity represents a systemic and financial risk; and
- D) how such risks manifest at individual company level.

### 1 *The global economy is dependent on ecosystem services*

The Earth's natural processes that maintain our planet in a state suitable for human habitation underpin the economic system, thus underlying the prosperity and stability of human societies.

There is strong evidence that the global economy is inherently dependent on the provision of goods and services that derive from these natural processes..<sup>294</sup> Around 40% of total annual world trade between 2010 and 2019 was made of nature-dependent exports,<sup>295</sup> while it is estimated that approximately US\$44 trillion of economic value generation – more than half of global GDP – is moderately or highly dependent on nature and ecosystem services.<sup>296</sup> Risk of loss of biodiversity - one of the main elements of ecosystems which enables them to generate ecosystem services - has been listed in the WEF's 2022 Global Risk Report in the top three most severe global risks in the next ten years.<sup>297</sup> In other words, the evidence of our economic dependencies on nature is unequivocal.

All economic actors are, directly or indirectly, dependent on ecosystem services. Ecosystem services can be defined as benefits provided to human societies and economies by processes occurring naturally in healthy ecosystems.<sup>298</sup> For example, ecosystem services preserve the quality of life-sustaining water and air and provide essential materials to meet our dietary (food), health (medicine) and housing (food, fuel) needs.

<sup>293</sup> NGFS and INSPIRE, [NGFS Occasional Paper: Central banking and supervision in the biosphere: An agenda for action on biodiversity loss, financial risk and system stability: Final Report of the NGFS-INSPIRE Study Group on Biodiversity and Financial Stability](#) (March 2022); UN Principles for Responsible Investment, [Investor Action on Biodiversity](#) (2020); TNFD, [Nature in Scope](#) (June 2021); World Economic Forum, [Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy](#) (January 2020); OECD, [Biodiversity: Finance and the Economic and Business Case for Action](#) (2019); UK HM Treasury, [The Economics of Biodiversity: The Dasgupta Review Government response](#) (2021); Australian Government, Department of Climate Change, Energy, the Environment and Water, [Financing Solutions for Nature](#) (last accessed 2 December 2022); Funding for the TNFD is provided by the governments of Australia, France, the Netherlands, Switzerland and the United Kingdom: TNFD, [About](#) (last accessed 2 December 2022); De Nederlandsche Bank, [Indebted to nature – Exploring biodiversity risks for the Dutch financial sector](#) (2020); Bank of Malaysia and the World Bank, [An Exploration of Nature-Related Financial Risks in Malaysia](#) (2022); Banque de France, [A “Silent Spring” for the Financial System? Exploring Biodiversity-Related Financial Risks in France](#) (2021); Pietro Calice, Federico Diaz Kalan, and Faruk Miguel, [Nature- Related Financial Risks in Brazil](#) (2021).

<sup>294</sup> For example: A 2018 assessment of the FTSE 100 Index using information in the [Natural Capital Finance Alliance's ENCORE tool](#) found that 13 of the sectors in the FTSE 100, representing a total of \$1.6 trillion in market capitalisation, were associated with production processes that have highly material dependence on nature (accessed 10 November 2022); Moody's Investor Services reported that there are nine sectors with almost \$1.9 trillion in rated debt that have “high” or “very high” inherent exposure to natural capital and 24 industries with \$9.6 trillion of debt that have “moderate exposure” to natural-capital risks, Bloomberg UK, [Moody's Has a \\$1.9 Trillion Warning Over Biodiversity](#) (September 2022).

<sup>295</sup> Planet Tracker, [Nature Dependent Exporters: What do they have in common?](#) (September 2022).

<sup>296</sup> World Economic Forum, [Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy](#) (January 2020).

<sup>297</sup> WEF, [Global Risks Report 2022](#) (January 2022).

<sup>298</sup> IPBES, [Global Assessment Report on Biodiversity and Ecosystem Services](#) (2019).

Figure 7 gives examples of business sectors that are dependent on particular ecosystem services. The economy plays a vital part in meeting people's needs by extracting, processing and supplying these benefits to consumers. All economic actors across value chains - from local farmers to processing plants and multinational conglomerates - rely on ecosystem services for their business's output, stability and success.

**Figure 7: Ecosystem services<sup>299</sup> can be categorised as provisioning, regulating and cultural services.<sup>300</sup>**

**Provisioning ecosystem services** provide materials and energy for products that humans derive from the environment, such as fresh water, food, fuel and pharmaceuticals.

**Regulating ecosystem services** regulate and maintain ecosystem processes such as flood prevention or erosion control.

**Cultural ecosystem services** provide non-material benefits, such as spiritual experiences, recreation and well-being (physical and mental).

This table outlines categories of ecosystem services as adopted by the Taskforce on Nature-related Financial Disclosures (TNFD)<sup>301</sup> and a non-exhaustive list of dependent sectors and industries:

Provisioning ecosystem services	Examples of dependent sectors and industries
Water supply	Food and beverages, agriculture
Genetic material	Agriculture, forestry, pharmaceuticals
Biomass provisioning	Energy
Other provisioning services (food, fibre... etc.)	Fashion, retail, fisheries, aviation, automobile, industrials, forestry, natural resources, pharmaceuticals
Regulating ecosystem services	Examples of dependent sectors and industries
Pollination	Agriculture, fashion, food and beverages
Soil and sediment retention	Agriculture, fashion, food and beverages
Water flow regulation	Construction, real estate
Solid waste remediation	Agriculture, construction, real estate
Water purification	Food and beverages, agriculture, health care
Flood mitigation	Construction, real estate
Air filtration	Construction, real estate, health care
Soil quality regulation	Agriculture, construction, real estate, mining

<sup>299</sup> Sometimes also referred to as 'nature's contributions to people', see Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) conceptual framework, categorised into regulating, material, and non-material contributions. These largely correspond with regulating, provisioning and cultural ecosystem services: Sandra Diaz et al., Science, [Assessing nature's contributions to people](#) (2018) 359 Issue 6373; IPBES, [Glossary: ecosystem services](#) (last accessed 10 November 2022); IPBES, [The Global Assessment Report on Biodiversity and Ecosystem Services](#) (2019); PNAS, [Global trends in nature's contributions to people](#) (2020).

<sup>300</sup> Millennium Assessment, [Natural Assets and Human Well-Being](#) (last accessed 10 November 2022); Millennium Ecosystem Assessment, [Ecosystems and their Services](#) (2001); Partha Dasgupta, UK Government, [The Economics of Biodiversity: the Dasgupta Review](#) (2021).

<sup>301</sup> Taskforce on Nature-Related Financial Disclosures, [TNFD framework, Version v0.3 Beta Release](#) (2022).

<b>Provisioning ecosystem services</b>	<b>Examples of dependent sectors and industries</b>
Nursery population and habitat maintenance	Fisheries, tourism
Local (micro and meso) climate regulation	Agriculture, food and beverages, fashion, tourism
Biological control	Agriculture, food and beverages, fashion, health care
Global climate regulation	Agriculture, construction, real estate, insurance
Rainfall pattern regulation	Agriculture, construction, real estate, insurance
Storm mitigation	Agriculture, construction, real estate, oil and gas, insurance
Noise attenuation	Tourism, real estate
Other regulating services	Agriculture, fashion, food and beverages, construction, real estate
<b>Cultural ecosystem services</b>	<b>Examples of dependent sectors and industries</b>
Recreation-related services	Tourism
Visual amenity services	Tourism, entertainment (including film and media)
Education, scientific and research services	Education, science
Spiritual, artistic and symbolic services	Education, artistic and cultural industries
Other cultural services	Tourism, media

Dependence on biodiversity varies across industries. Global value chains act as transmission channels turning national nature dependencies of one country into global risk factors for other countries, economies and companies. This is especially the case for those value chains that hold a substantial share of the global economy, despite having relatively low exposure to nature-related risk within their own borders. This makes the risk of local biodiversity loss a global risk with potential cascading knock-on effects. Many of the natural raw materials supplying Europe and North America (on which those economies depend) originate in Asia, Africa and South America, where the farming or extraction of those materials creates negative impacts on ecosystems. For example, beef or timber supplied from deforested areas in South America, iron ore supplying the global construction industry mined in Africa or South America, or cotton or palm oil supplied from Asia have potential to create biodiversity risk. Some countries are particularly dependent on ecosystem services for their outputs. Sectors with high dependencies on nature generate 33% of GDP of India and 32% of GDP of Indonesia.<sup>302</sup> Larger economies such as China (US\$2.7 trillion), the EU (US\$2.4 trillion) and the USA (US\$2.1 trillion) have the highest absolute amounts of GDP in sectors dependent on ecosystem services.<sup>303</sup>

<sup>302</sup> World Economic Forum, [Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy](#) (January 2020).

<sup>303</sup> World Economic Forum, [Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy](#) (January 2020).



On a sector level, large industries such as construction, agriculture, food and beverages, transport, energy, mining, pharmaceuticals and forestry are directly dependent on nature. Many industries are indirectly dependent on nature through their supply chains, such as fashion, products that incorporate agricultural (e.g. cotton), forest raw materials (e.g. pulp and paper, timber, cosmetics), mined raw materials (e.g. minerals used in batteries) or pharmaceuticals that mimic the compounds found in plants. The three largest sectors highly dependent on nature generate close to US\$8 trillion of gross value added (GVA), roughly twice the size of the German economy. Construction generates US\$4 trillion GVA, agriculture US\$2.5 trillion GVA, and food and beverages US\$1.4 trillion GVA.<sup>304</sup> Hidden dependence is demonstrated by a further six industries: chemicals and materials, aviation, travel and tourism, mining and metals, and real estate. Despite having less than 15% of their GVA highly dependent on nature, approximately 50% of these industries' supply chain GVA is highly or moderately dependent on nature.<sup>305</sup> Similarly to country-specific nature risks, industry-specific nature risks are transmitted to other industries via globalised value chains, making no industry or country immune to the risks related to loss of biodiversity and ecosystem services.

## 2 Ecosystem services link intrinsically to biodiversity

Biodiversity or biological diversity is the variability among living organisms, from bacteria to large mammals, both terrestrial and aquatic. It includes diversity within species, between species and of ecosystems.<sup>306</sup> Biodiversity therefore is a core indicator of the richness of the variety of life on earth. The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (**IPBES**), an independent intergovernmental body of experts dedicated to providing policymakers with the best scientific advice on biodiversity, explains **nature**<sup>307</sup> as encompassing both the living and the non-living/ non-renewable elements, such as water and minerals, while emphasising the living elements of this.<sup>308</sup> On the other hand, **biodiversity**:

- A) only relates to the living elements of nature;
- B) may influence the non-living elements of nature (e.g. water quality - as described below);
- C) is an indicator of the condition of nature; and
- D) secures the flow of benefits from nature ('ecosystem services' - as described above).<sup>309</sup>

Although it is important to appreciate the differences between the two terms, this paper uses them interchangeably to refer to the living element of the natural world.

Biodiversity interacts with non-living elements in ecosystems to render essential ecosystem services on which economies depend.

<sup>304</sup> World Economic Forum, *Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy* (January 2020).

<sup>305</sup> World Economic Forum, *Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy* (January 2020).

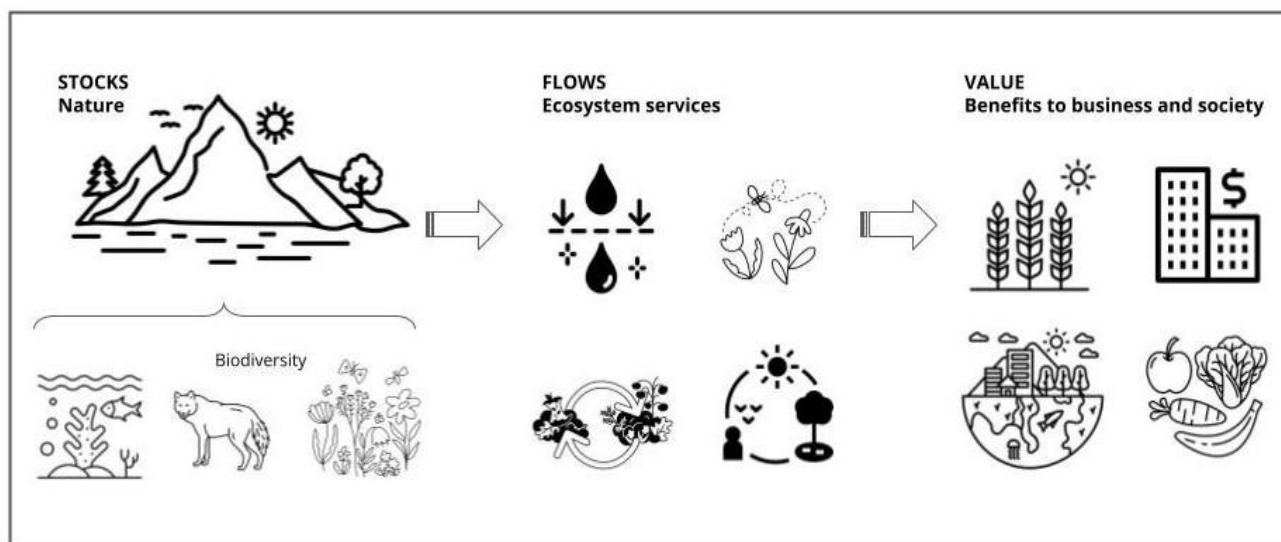
<sup>306</sup> Article 2 of the [Convention on Biological Diversity](#).

<sup>307</sup> Similarly to nature, the term natural capital refers to both, living and non-living elements of ecosystems. The term nature describes the elements of the natural world as biomes and ecosystems. The term natural capital is used to conceptualise the same elements as capital assets (stocks and services). The two terms have been used in both scientific and economic literature in which biodiversity is the living and renewable element of each - TNFD, [beta v.01](#), March 2022.

<sup>308</sup> Diaz et al, [The IPBES Conceptual Framework](#), (June 2015) 4 (Six main elements to link people and nature)

<sup>309</sup> Capitals Coalition and Cambridge Conservation Initiative, [Integrating biodiversity into natural capital assessments](#) (2020), 12.

**Figure 8: Relationship between biodiversity, nature, ecosystem services and business value**



Adapted from Capitals Coalition<sup>310</sup>

In each ecosystem,<sup>311</sup> biodiversity interacts with and may influence the non-living elements of the natural world. These complex interactions between living and non-living elements of the natural world secure the flow of ecosystem services to economies.<sup>312</sup> For instance, in natural watersheds, rainwater flows down tree trunks, among leaves, into soil, between rocks, along rivers, and eventually into lakes and aquifers. This complex process of slow movement through sand and rocks accompanied by competition and predation among microorganisms in streams and rivers purifies the water to a drinkable standard (save for human contamination by chemicals and waste).<sup>313</sup> Without rich biodiversity - the trees and microorganisms in the water purification example - ecosystems cannot function properly and the services they provide to people, countries and economies diminish in quality and volume. Lower biodiversity within natural stocks may yield lower quality ecosystem services.<sup>314</sup>

Biodiversity loss is currently occurring at an accelerating rate. According to IPBES, biodiversity has undergone a steep decline in the past 50 years. The current rate of extinction of species is between 100 and 1,000 times higher than the reference rate of the past million years, which some have termed the ‘sixth mass extinction’.<sup>315</sup> While all species will ultimately go extinct, the natural rate of extinction was previously much lower, with the average longevity of animal species estimated to be around two million years.<sup>316</sup>

<sup>310</sup> Capitals Coalition and Cambridge Conservation Initiative, [Integrating biodiversity into natural capital assessments](#) (2020) 10; Images from [The Noun Project](#) (last accessed 10 November 2022).

<sup>311</sup> Ecosystems are “a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit”: [Convention on Biological Diversity](#), Article 2

<sup>312</sup> Capitals Coalition and Cambridge Conservation Initiative, [Integrating biodiversity into natural capital assessments](#) (2020), 12.

<sup>313</sup> UN Department of Economic and Social Affairs, Statistics Division, [Accounting for the water purification ecosystem service](#) (2019).

<sup>314</sup> Capitals Coalition and Cambridge Conservation Initiative, [Integrating biodiversity into natural capital assessments](#) (2020), 12.

<sup>315</sup> Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, [The Global Assessment Report on Biodiversity and Ecosystem Services](#) (2019); See Elizabeth Kolbert, *The Sixth Extinction* (2014); The Natural History Museum, *What is mass extinction and are we facing a sixth one?* (19 May 2021).

<sup>316</sup> Rob Dunn, *A Natural History of the Future: What the Laws of Biology Tell Us About the Destiny of the Human Species* (2022) ISBN-10: 1399800124; Charles R Marshall, [Five palaeobiological laws needed to understand the evolution of the living biota](#), *Nature ecology & evolution* (2017).

### 3 *Loss of biodiversity and ecosystem services is a systemic risk*

The value of ecosystem services has been estimated to amount to US\$125-140 trillion per year - more than one and a half times global GDP.<sup>317</sup> Experts also estimate that the impacts of loss of biodiversity and ecosystem services are in trillions of dollars of global GDP.<sup>318</sup> Nature has been providing countries and economies with ecosystem services free of charge for millennia. However, both the value of ecosystem services and the economic impacts of ecosystem degradation remain broadly unaccounted or under-accounted for in conventional economic models and corporate accounting practices.<sup>319</sup> As a result, mainstream economic thinking presents an overly optimistic growth scenario which underappreciates the potential economic impacts of biodiversity decline and loss of ecosystem services.<sup>320</sup>

A World Bank report identified that by a conservative estimate a collapse in select services such as pollination, provision of food from marine fisheries and timber from native forests could result in a significant decline in global GDP amounting to US\$2.7 trillion in 2030.<sup>321</sup> This loss will not materialise only in the future: between 1997 and 2011, the world lost an estimated US\$4-20 trillion per year in ecosystem services owing to land-cover change and US\$6-11 trillion per year from land degradation. In comparison, the scale of losses during the 2008 financial crisis amounted to 'just' US\$2.8 trillion.<sup>322</sup> The analysis of the projected decline in the ecosystem services caused by the conversion of natural land to cropland, pastureland and forest plantations has resulted in a projected loss of US\$90-225 billion in global real GDP in 2030 (in gross terms, without setting off the gains associated with exploitation of the converted land).<sup>323</sup>

Biodiversity loss can also constitute a systemic risk that can arise from modest tipping points and reverberate through the entire financial system, through reduced quality of ecosystem services, ecosystem collapse and the associated economic losses. National central banks and the World Bank, among others, have already recognised that biodiversity loss can create systemic risks which could threaten global financial stability.<sup>324</sup> These risks could impact the entire financial system, as opposed to individual parts, and may be characterised by modest tipping points, which combine indirectly to produce large failures and cascading interactions of physical and transition risks.<sup>325</sup> The possible roots of the COVID-19 pandemic in environmental degradation have been identified as an example of such systemic risks playing out in the complex relationship between planetary and human health, as well as in the global economy.<sup>326</sup> Failure to address loss of biodiversity and ecosystem services may lead to a risk of double loss to the economic system. Firstly, it may forego the net GDP gains that could be reached by maintaining or enhancing current levels of ecosystem services provision. Secondly, it may expose the planet to the risk of ecosystem collapse and associated economic losses.<sup>327</sup>

<sup>317</sup> Distinct from this value, US\$44 trillion of economic value generation is moderately or highly dependent on nature and ecosystem services: World Economic Forum, [Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy](#) (January 2020).

<sup>318</sup> Dasgupta, P, [The Economics of Biodiversity: The Dasgupta Review](#) (2021)

<sup>319</sup> The Law Society, [How biodiversity loss could disrupt businesses in the next 10 years](#) (2022); OECD, [Biodiversity: Finance and the Economic and Business Case for Action, Executive Summary and Synthesis of the report prepared for the G7 Environment Ministers' Meeting](#) (2019) 4, 7. This is not to discount the models that do in various ways account for natural capital, albeit sometimes in a way that can be perceived as flawed and which does not cover exhaustibility. See Joseph Stiglitz, 'Growth with Exhaustible Natural Resources: The Competitive Economy (1974) 41(5) Review of Economic Studies 139-152, Dasgupta, P, [The Economics of Biodiversity: The Dasgupta Review](#) (2021) and Faucheux et al, 'Neoclassical Natural Capital Theory and "Weak" Indicators for Sustainability' (1997) 73(4) Land Economics 528.

<sup>320</sup> Dasgupta, P, [The Economics of Biodiversity: The Dasgupta Review](#) (2021)

<sup>321</sup> The World Bank Group, [The Economic Case for Nature](#) (2021).

<sup>322</sup> OECD, [Biodiversity: Finance and the Economic and Business Case for Action](#) (2019) 46, 47; EY, [Waking up to nature – the biodiversity imperative in financial services](#) (2021)

<sup>323</sup> The World Bank Group, [The Economic Case for Nature](#) (2021).

<sup>324</sup> The Network for Greening the Financial System (a group of central banks and financial supervisors) found that biodiversity loss is within their mandate as a threat to financial stability. NGFS and INSPIRE, [NGFS Occasional Paper: Central banking and supervision in the biosphere: An agenda for action on biodiversity loss, financial risk and system stability: Final Report of the NGFS-INSPIRE Study Group on Biodiversity and Financial Stability](#) (March 2022).

<sup>325</sup> TNFD, [beta v.01](#), March 2022

<sup>326</sup> The World Bank Group, [The Economic Case for Nature](#) (2021).

<sup>327</sup> The World Bank Group, [The Economic Case for Nature](#) (2021).

#### 4 *The interface of each company with biodiversity and ecosystem services creates dependencies, impacts, risks and opportunities for that company*

Having seen how biodiversity risk manifests at the global and industry level, how is this relevant to individual companies?

Many companies have direct or indirect **dependencies** on ecosystems through the critical (and often hidden) value of ecosystem services which support their businesses. The value of ecosystem services is determined by the quality of biodiversity that underpins them.

Corporations not only depend on biodiversity but may also be responsible for significant direct or indirect **impacts** on biodiversity through their activities. There is a plethora of evidence of corporate impacts on biodiversity including, for example: habitat loss and degradation due to land use; over-exploitation of natural resources; water, land and air pollution; contributions to human-induced climate change; and introduction of invasive alien species, all scientifically referred to as drivers of biodiversity loss.<sup>328</sup> Many impacts can be attributed directly to particular industries. For instance, farming of cotton to supply industries, including fashion, is responsible for 24% of insecticide use and 11% of pesticide spread, causing land and water pollution.<sup>329</sup> Global fisheries have fully exploited, overexploited or depleted 76% of the world's monitored marine fish stocks,<sup>330</sup> reducing the ability of fish stocks to recover and continue to render essential food provisioning ecosystem service. These drivers upset ecosystem equilibria, directly affecting ecosystems and/or the ecosystem services on which companies and society depend. Therefore a company's direct or indirect impacts can have consequences for its own business, other businesses and society.

Corporate dependencies and impacts on biodiversity can lead to biodiversity **risks**, all of which may affect a company's business and financial performance and some of which may be categorised as material risks. These can be:

**Physical risks**, which arise when biodiversity loss damages ecosystem equilibria. They manifest directly in a decline of ecosystem services. (For example, damage to rich natural vegetation may disrupt the ecosystem service of local climate regulation, causing climate-related risks).

**Transition risks**, when technological advancements, regulatory changes, policies or legislation arise from the transition causing an unprepared company to have difficulties in adjusting. (For example technological advancements such as development of leather and protein alternatives may challenge entire business models by driving down prices to the extent that traditional production becomes economically unviable).

**Legal risks**, arising from mismanagement of physical and transition biodiversity risks, such as litigation, regulatory penalties, insurance costs or reputational damage as a result of a company's negative impacts or its misleading marketing of its approach to biodiversity protection.<sup>331</sup>

<sup>328</sup> Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), [Models of drivers of biodiversity and ecosystem change](#) (accessed 10 November 2022).

<sup>329</sup> OECD, [Biodiversity: Finance and the Economic and Business Case for Action](#) (2019) 36.

<sup>330</sup> Food and Agriculture Organisation of the United Nations, [The State of the World's Fisheries and Aquaculture](#) (2018).

<sup>331</sup> These categories of risk were originally identified in relation to climate by the Bank of England (Bank of England Prudential Regulation Authority, [The Impact of Climate Change on the UK Insurance Sector](#) (2015)). Many organisations have adopted these terms, with variations, in relation to both climate and biodiversity risk. The TCFD uses the two categories of physical and transition risks (where legal risks are included within the latter (TCFD, [Recommendations of the Task Force on Climate-related Financial Disclosures](#) (2017) 5) and the TNFD uses the categories of physical, transition and systemic risks (TNFD, [The TNFD Nature-Related Risk and Opportunity Management and Disclosure Framework Beta v0.1](#) (March 2022)). For comprehensive detail on these risks, see CCLI, [The emergence of foreseeable biodiversity-related liability risks for financial institutions](#) (2019); WWF, [The Nature of Risk](#) (2019); Cambridge Institute for Sustainability Leadership (CISL), [Handbook for Nature-related Financial Risks](#) (2021); CISL, [Assessing Nature related Financial Risks: Upcoming use cases from financial institutions](#) (2021); CISL, [Why nature matters: Nature-related risks and opportunities for insurance underwriting](#) (2022) and CISL, [Integrating Nature: The case for action on nature-related financial risks](#) (2022).

Corporate dependencies and impacts on biodiversity can lead to **opportunities** to manage risks and improve a company's prospects. For example, "natural capital" value arising from biodiversity conservation or creation, improving brand value through reputational benefits, better resource management for long-term business viability, cost savings and improved operational efficiency, increased market share, new and more competitive products, business models, technologies and services, better access to capital, new markets and revenue streams and better stakeholder relationships. Failing to seize these opportunities may have a bearing on the long-term success of a company in a world that is rapidly adapting to and affected by the biodiversity crisis.<sup>332</sup>

To conclude, corporate actors in the global economy depend on ecosystem services for their success. Ecosystem services, in turn, depend on the presence of rich biodiversity. The recorded loss of biodiversity leads to a decline in ecosystem services, which may pose a systemic risk to the entire global economy. Corporate activities have both dependencies and impacts on biodiversity, which can lead to physical, transition and legal biodiversity risks, all of which may have material consequences for a company's business and trading performance. Depending on the sector in which a particular company operates, some of these risks may amount to its material financial risks. This is the context against which we can interpret the directors' duties outlined above.

[Appendix 2](#) uses case studies to illustrate these corporate interfaces with biodiversity.

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<sup>332</sup> OECD, [Biodiversity: Finance and the Economic and Business Case for Action, report prepared for the G7 Environment Ministers' Meeting](#) (2019) 35; Business for Nature, [COP15 Business Statement for Mandatory Assessment and Disclosure - FAQ](#) (2022)

## Appendix 2 - Case studies: the interface between companies and biodiversity

This Appendix aims to provide tangible examples to companies of how many different types of business may have impacts and dependencies on nature that may not be immediately evident. It should be of particular use to signpost business resources for companies, such as expert reports and examples of how other companies examine and report on their biodiversity dependencies, impacts, risks and opportunities.

[Agriculture](#) and [construction](#) are two of the largest sectors that are highly dependent on nature. Agriculture also constitutes part of the supply chain of the third highly nature-dependent sector, food and beverages.<sup>333</sup> These sectors have value chain links to many other industries. Their multiple interrelations mean that their dependencies and impacts on biodiversity can constitute less obvious or hidden dependencies and impacts for many other companies. The case studies aim to demonstrate:

- A) the significance of the dependencies on ecosystem services and impacts on biodiversity for these sectors (and the companies within it);
- B) how these dependencies and impacts on biodiversity have cascading effects to companies in their value chain and the entire economy; and
- C) companies within each sector that have identified biodiversity dependencies, impacts, risks and opportunities.

Other sectors considered to have high biodiversity risk exposure include electricity, food & drug retailers, food producers & processors, forestry & paper, leisure & hotels, mining, oil & gas and utilities.<sup>334</sup>

Sectors considered to have medium biodiversity risk exposure include beverages, chemicals, financial services, retailers, household goods & textiles, personal care & household products, pharmaceuticals & biotechnology, support services, tobacco and transport.<sup>335</sup>

The third part of this Appendix 2 is a [table of multi-sector examples of company interfaces with nature](#), aiming to illustrate to companies in a wide variety of sectors where they may have their own dependencies and impacts on biodiversity, either directly or through their value chain.

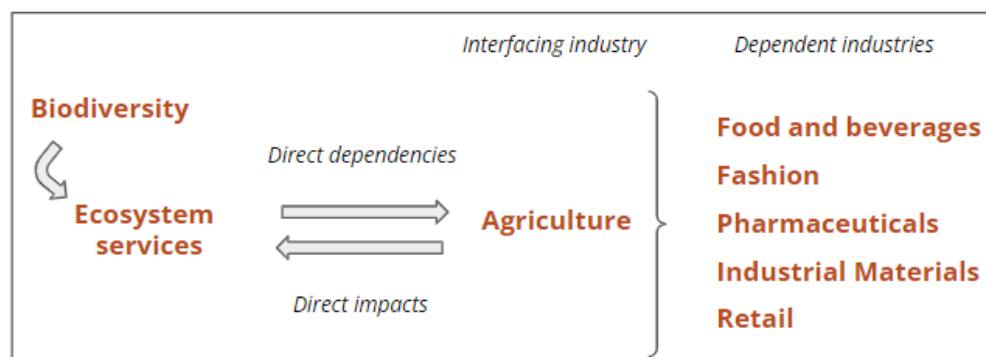
<sup>333</sup> World Economic Forum, [Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy](#) (January 2020) 8.

<sup>334</sup> ACTIAM, ASN Bank, CDC Biodiversité, [Common ground in biodiversity footprint methodologies for the financial sector](#) (2018) 8; KPMG, [The time has come: The KPMG Survey of Sustainability Reporting](#) (2020) 29.

<sup>335</sup> ACTIAM, ASN Bank, CDC Biodiversité, [Common ground in biodiversity footprint methodologies for the financial sector](#) (2018) 8; KPMG, [The time has come: The KPMG Survey of Sustainability Reporting](#) (2020) 29.

## Case study - the agricultural industry

**Figure 9: Agricultural value chain of biodiversity dependencies and impacts**



### 1 Global agricultural industry - facts

Many companies are likely to have a connection to the agricultural industry, which is a multi-trillion-dollar global industry that connects economies all around the world via complex networks of value chains, which serve as risk transmission channels. The agricultural industry comprises all forms of cultivating plants and livestock for human consumption (including food and pharmaceuticals) and includes activities related to processing crops, as well as breeding, raising and caring for animals.<sup>336</sup> In 2018, agriculture accounted for 4% of global GDP<sup>337</sup> (US\$81.3 trillion).<sup>338</sup> In some low and middle income countries agricultural output can constitute more than 25% of GDP.<sup>339</sup> At the same time, some of the world's largest economies, including the USA (15%)<sup>340</sup>, China, Japan, Germany and the UK (46%)<sup>341</sup> lack self-sufficiency and rely heavily on food imports.<sup>342</sup> According to some estimates, more than half of the world's population could be fully reliant on food imports by 2050.<sup>343</sup> This interdependence between agricultural outputs of some countries and food security of others means that decline in food production in one region may translate into systemic shocks threatening global food supply and economic stability.

The agricultural industry is a cornerstone of many other industries, such as food and beverages, pharmaceuticals, fashion and retail, which depend on the provision of plant-based and animal-based materials for their own economic output. Many companies will have dependencies and impacts derived from agriculture, which links intrinsically to other industries dependent on agricultural materials. For instance, agriculture supplies the food and beverages industry with fresh and animal produce, the textiles and fashion industry with natural fibres and raw materials for garment production, like cotton, hemp, flax, wool and leather.<sup>344</sup> Other industries depend on agriculture for supply of materials that form part of the assembly process of the end product.<sup>345</sup> These interlinkages make stability and continuity of the agricultural industry crucial for the success or failure of dependent industries.

<sup>336</sup> International Labour Organization, [Safety and Health in Agriculture](#)(2000), 77.

<sup>337</sup> World Bank, [Agriculture and Food](#) (accessed 10 November 2022).

<sup>338</sup> Food and Agriculture Organisation of the United Nations, [Gross domestic product and agriculture value added 1970–2018](#) (2018).

<sup>339</sup> Food and Agriculture Organisation of the United Nations, [FAO Statistical Yearbook 2012: Part 1 - Macroeconomy](#) (2012).

<sup>340</sup> FDA, [FDA Strategy for the Safety of Imported Food](#) (September 2022).

<sup>341</sup> DEFRA, [United Kingdom Food Security Report 2021: Theme 2: UK Food Supply Sources](#) (22 December 2021).

<sup>342</sup> Graham K. MacDonald, Environmental Research Letters, [Eating on an interconnected planet](#) (2013). World Atlas, [Countries Most Dependent On Others For Food](#) (accessed 10 November 2022) ; FDA, [FDA Strategy for the Safety of Imported Food](#) (September 2022); DEFRA, [United Kingdom Food Security Report 2021: Theme 2: UK Food Supply Sources](#) (22 December 2021).

<sup>343</sup> Graham K. MacDonald, Environmental Research Letters, [Eating on an interconnected planet](#) (2013).

<sup>344</sup> Carol Viana, [Regenerative Agriculture and Fashion: the future of the second largest polluter in the world](#) (August 2021).

<sup>345</sup> For example aviation, through the conductive rubber in aeroplane tyres, see Section 3. Onokpise and Louime, [The Potential of the South American Leaf Blight as a Biological Agent](#) (October 2012).

**The anticipated growth of the agricultural industry will put more pressure on the natural ecosystems on which agricultural outputs inherently depend.** The agricultural sector is projected to grow by 60 - 70%<sup>346</sup> to meet the needs of a growing global population, which is estimated to reach 9.7 billion by 2050 from today's 8 billion.<sup>347</sup> Consequently, while today agriculture covers nearly 40% of the ice-free land on Earth, which is expected to increase by 593 million hectares in 2050 compared to 2010, an area nearly twice the size of India.<sup>348</sup>

## 2 *The corporate interface with biodiversity through the agricultural sector's dependencies*

**The agricultural industry relies on an extensive range of biodiversity-dependent ecosystem services, including provisioning and regulating ecosystem services (see Figure 7).** The productivity of the agricultural industry, along with all its dependent industries and their value chains, relies on essential provisioning ecosystem services for the supply of raw materials, such as food, water, fibre and protein.<sup>349</sup> The crop and livestock agriculture industries have a very high direct dependency upon nature via 18 and 19 different identified ecosystem services respectively.<sup>350</sup> Regulating ecosystem services, such as nutrient cycling, pest and soil quality regulation, air quality, climate regulation, and natural hazard control are essential to global agricultural outputs.<sup>351</sup> The value of these ecosystem services, delivered in large parts by biodiversity in the relevant ecosystem, is enormous and often underappreciated.<sup>352</sup> Consequently, although it is certain that the loss of these ecosystem services would have significant impacts on agricultural yields and knock-on effects across the entire economy, it is hard to estimate the cost of their loss with certainty.

**The agricultural sector is also heavily reliant on pollination ecosystem services. At least 35% of global agricultural output depends on pollination,<sup>353</sup> making the loss of these services financially material for many dependent industries and economies.** The global production of food and other plant-based products is reliant on pollination ecosystem services performed by various species of insects and other animals, including bees. An estimated 87.5% of all flowering plant species are pollinated by animals,<sup>354</sup> while 70% of food crops depend at least to some extent on biodiversity-dependent pollination.<sup>355</sup> The presence of biologically diverse species of insects and animals has been found to increase the size, quality and stability of harvest for 70% of the world's leading crops.<sup>356</sup> In financial estimates, the annual global value of crop pollination services is between US\$195 billion and \$387 billion, which are provided free of charge.<sup>357</sup> An

<sup>346</sup> George Silva, [Feeding the world in 2050 and beyond – Part 1: Productivity challenges](#) (December 2018); High Level Expert Forum, [Global agriculture towards 2050](#) (October 2019).

<sup>347</sup> UN Department of Economic and Social Affairs, [World population to reach 8 billion on 15 November 2022](#) (July 2022).

<sup>348</sup> World Resources Institute, [Creating a Sustainable Food Future](#) (July 2018).

<sup>349</sup> Natural Capital Coalition, [Natural Capital Protocol](#) (2016), 17. In addition, provisioning ecosystem services are often supplying a disproportionately narrow range of crops. More than half of the world's food comes from rice, wheat and maize, which already suffer annual losses of up to 16% of total production due to invasive species: World Economic Forum, [Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy](#) (2020); Centre for Agriculture and Bioscience International, [Invasive species: The hidden threat to sustainable development](#) (2018).

<sup>350</sup> Data taken from the ENCORE database. The Australian Conservation Foundation, [The nature-based economy: How Australia's prosperity depends on nature](#) (2022), 42.

<sup>351</sup> Food and Agriculture Organisation of the United Nations, [Ecosystem Services Sustain Agricultural Productivity and Resilience](#) (accessed 10 November 2022); Food and Agriculture Organisation of the United Nations, [The State of the World's Biodiversity for Food and Agriculture](#) (2019).

<sup>352</sup> Power, Philosophical Transactions of the Royal Society, [Ecosystem services and agriculture: tradeoffs and synergies](#) (2010).

<sup>353</sup> Food and Agriculture Organisation of the United Nations, [FAO's Global Action on Pollination Services for Sustainable Agriculture](#) (accessed 10 November 2022).

<sup>354</sup> Ollerton, & Tarrant., [How many flowering plants are pollinated by animals?](#) *Oikos* (2011).

<sup>355</sup> IPBES, [The assessment report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on pollinators, pollination and food production](#) (2017).

<sup>356</sup> Klein et al., [Importance of pollinators in changing landscapes for world crops](#), *Proceedings of the Royal Society - Biological Sciences* (2007); A Costa Rican study found a 20% increase in yield in coffee plantations 1km from the forest.

<sup>357</sup> Porto et al., [Pollination ecosystem services: A comprehensive review of economic values, research funding and policy actions](#), *Food Security* (19 May 2020).



annual market value of between US\$235 billion and US\$577 billion has been estimated as directly linked to animal pollination.<sup>358</sup> The value of pollination services is at risk as pollinator populations decline globally.

### 3 *The corporate interface with biodiversity through the agricultural sector's impacts*

**The agricultural industry and its dependent industries have significant biodiversity impacts. Many of these impacts directly threaten these industries' biodiversity dependencies, exacerbating their own biodiversity risks.** While heavily dependent on rich biodiversity, the agricultural industry also has significant impacts on the very fabric of ecosystems on which it depends. Land use change, pollution, habitat loss and habitat fragmentation due to agricultural expansion are some of the key drivers of biodiversity decline and loss of ecosystem services.<sup>359</sup> For example, 62% of 8,500 threatened or near-threatened species in one study were affected by agriculture, timber plantation and/ aquaculture.<sup>360</sup> A key driver of biodiversity loss is land use change, in particular through animal agriculture, which directly impacts the biomass distribution on Earth and drives further arable agriculture to produce livestock feed (see the [multi-sector case study table](#)).<sup>361</sup> Between 1997 and 2011, the world lost an estimated US\$4-20 trillion per year in ecosystem services owing to land-cover change and US\$6-11 trillion per year from land degradation.<sup>362</sup> Such biodiversity impacts of the agricultural industry exacerbate its own biodiversity risks. For example, unsustainable farming methods are stripping topsoil of nutrients at ten to 40 times the rate at which nature can replenish them. These methods are leading to increased soil erosion and decreases in soil moisture, which impacts on soil quality, on which agriculture is reliant.<sup>363</sup> The same is true for the industries dependent on agricultural outputs. The fashion industry, for instance, contributes to biodiversity loss via land use for the production of raw materials, most notably animal fibres, such as wool and cashmere, and leather.<sup>364</sup>

**International trade exacerbates negative biodiversity impacts. Many negative biodiversity impacts of agricultural production are not felt at the source of demand (often in the northern hemisphere) but at the source of materials (often in the southern hemisphere), making value chain traceability a crucial element in identifying and mitigating these impacts.** The raw materials in many products consumed in Europe and North America are sourced from Africa, Asia and South and Central America. 33% of biodiversity impacts in Central and South America and 26% in Africa are driven by consumption in other regions.<sup>365</sup> Most negative biodiversity impacts of the fashion industry occur in three distinct stages (and often geographical locations) - production of raw materials, preparation and processing, and end of life disposal.<sup>366</sup>

**The negative biodiversity impacts of the agricultural industry lead to a loss of ecosystem services, such as pollination, on which the industry itself depends for its own outputs.** Practices deployed in agricultural production may adversely affect ecosystem services, many of which play a significant role in supporting agricultural yields. Although there is no simple relationship between a single agricultural practice

<sup>358</sup> IPBES, [The assessment report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on pollinators, pollination and food production](#) (2017); Khalifa et al., [Overview of Bee Pollination and Its Economic Value for Crop Production](#), *Insects* (August 2021).

<sup>359</sup> OECD, [Biodiversity: Finance and the Economic and Business Case for Action, Executive Summary and Synthesis of the report prepared for the G7 Environment Ministers' Meeting](#) (2019).

<sup>360</sup> Maxwell, S., [The ravages of guns, nets and bulldozers](#), *Nature* (2016).

<sup>361</sup> Proceedings of the National Academy of Sciences of the United States of America, Bar-on, Phillips and Milo, [The biomass distribution on Earth](#) (2018)

<sup>362</sup> OECD, [Biodiversity: Finance and the Economic and Business Case for Action, Executive Summary and Synthesis of the report prepared for the G7 Environment Ministers' Meeting](#) (2019).

<sup>363</sup> University of Cambridge Institute for Sustainability Leadership (CISL), [Modelling better business: Nestlé trials natural capital premium with UK dairy farmers](#) (2018); UN Food and Agriculture Organization, [Livestock and Landscapes](#) (2012); European Commission and Plansup, [Application of the Biodiversity Footprint Methodology for the Dutch dairy sector](#) (2018); Unhealthy soils are less resilient to extreme weather, which can affect income through reduced crop quality or volume: University of Cambridge Institute for Sustainability Leadership (CISL) and NatWest Group, [Nature-related financial risk: use case. Land degradation, UK farmers and indicative financial risk](#) (2022).

<sup>364</sup> Kering, [Environmental Profit and Loss - 2019 Group Results](#) (2020).

<sup>365</sup> Marques, A. et al., [Increasing impacts of land use on biodiversity and carbon sequestration driven by population and economic growth](#), *Nature Ecology & Evolution*, (2019); Krausmann, F. and E. Langthaler, [Food regimes and their trade links: A socio-ecological perspective](#), *Ecological Economics* (2019).

<sup>366</sup> McKinsey, [Biodiversity: The next frontier in sustainable fashion](#) (23 July 2020).

and biodiversity decline, intensive agricultural practices represent a major threat to pollinator populations.<sup>367</sup> Fertiliser use, intensive tillage, heavy use of pesticides, crop monocultures (mainly to feed livestock) and high grazing/mowing intensity all dramatically reduce the size and diversity of pollinator communities.<sup>368</sup> Some of these impacts can be directly linked to a particular agricultural commodity. For instance, cotton production accounts for 16% of the world's insecticide use, which drives global pollinator decline.<sup>369</sup> Isolation from natural habitats and intensive pesticide use have been shown to result in far lower species diversity of bumblebees and butterflies, leading to decrease in agricultural yields.<sup>370</sup> This case exemplifies the causative effect of biodiversity impacts of the agricultural sector on its own biodiversity dependencies.

#### 4 Corporate recognition of dependencies, impacts, risks and opportunities arising from the agricultural industry

**Only a quarter of companies reviewed in a 2017 study acknowledged their dependencies and associated risk related to pollinator decline. The study authors concluded that this indicates either a lack of materiality or a failure to include risk of pollinator decline in risk reviews.**<sup>371</sup> The study reviewed public information on business dependencies of 27 companies, including Coca-Cola, L'Oréal, Marks & Spencer and Unilever. 52% mentioned pollination, while only 26% acknowledged dependencies on pollination ecosystem services and associated risks. All companies mentioned sustainable agriculture, which often includes conservation of pollinators, in their sustainability reports when identifying biodiversity risks.<sup>372</sup>

**Despite the difficulties in identifying direct biodiversity dependencies, companies in the 2017 study with a limited number of raw materials identified pollinator decline as a medium to high risk.**<sup>373</sup>

Identifying direct dependencies on pollination proved challenging, with less than half of the surveyed companies having a clear picture of which of their raw materials were dependent on pollinators.<sup>374</sup> Correspondingly, only half of the surveyed companies had taken steps to reduce corporate risks related to pollinator decline.<sup>375</sup> Awareness of dependencies was generally higher in companies with a limited number of raw materials. Companies that identified pollinator decline as a high operational risk included Mars (cocoa), Jordans (almonds, brazil nuts, blueberries, rapeseeds) and The Body Shop (almonds, brazil nuts, virgin coconut oil). The latter two listed pollination decline as a medium financial risk and Jordans listed it as a high risk in the legal and regulatory, reputational and marketing categories.<sup>376</sup>

**Significant retailers have not expressly recognised their dependencies on pollination ecosystem services but have engaged in efforts to restore native bee habitat on their suppliers' farms, which indicates an increasing corporate awareness of business dependencies on ecosystem services within their value chains.** John Lewis Partnership's (JLP) 2021/2022 Ethics and Sustainability Report suggests that pollinator decline may constitute a risk to the company: *"If biodiversity, including the abundance of pollinators, is neglected, it has the potential to disrupt our operations, increase costs through damage-control measures and heighten risks."*<sup>377</sup> Although there is no express acknowledgement of JLP's dependencies on the agricultural sector,<sup>378</sup> JLP's retail brand, Waitrose, has a ten-year Agriculture Plan, which includes a requirement that its dairy farmers set aside 10% of their land for biodiversity and habitat management.<sup>379</sup> Other corporations,

<sup>367</sup> IPBES, [The assessment report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on pollinators, pollination and food production](#) (2017).

<sup>368</sup> IPBES, [The assessment report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on pollinators, pollination and food production](#) (2017).

<sup>369</sup> Cambridge Institute for Sustainability Leadership (CISL), [Developing a Corporate Biodiversity Strategy](#) (2020).

<sup>370</sup> Benton et al., [Food system impacts on biodiversity loss: Three levers for food system transformation in support of nature](#) (February 2021).

<sup>371</sup> Cambridge Conservation Initiative, [The pollination deficit: Towards supply chain resilience in the face of pollinator decline](#) (2017).

<sup>372</sup> Cambridge Conservation Initiative, [The pollination deficit: Towards supply chain resilience in the face of pollinator decline](#) (2017).

<sup>373</sup> Cambridge Conservation Initiative, [The pollination deficit: Towards supply chain resilience in the face of pollinator decline](#) (2017).

<sup>374</sup> Cambridge Conservation Initiative, [The pollination deficit: Towards supply chain resilience in the face of pollinator decline](#) (2017).

<sup>375</sup> Cambridge Conservation Initiative, [The pollination deficit: Towards supply chain resilience in the face of pollinator decline](#) (2017).

<sup>376</sup> Cambridge Conservation Initiative, [The pollination deficit: Towards supply chain resilience in the face of pollinator decline](#) (2017).

<sup>377</sup> John Lewis Partnership, [Ethics and Sustainability Report](#) (2021/22).

<sup>378</sup> Cambridge Conservation Initiative, [The pollination deficit: Towards supply chain resilience in the face of pollinator decline](#) (2017).

<sup>379</sup> John Lewis Partnership, [Ethics and Sustainability Report](#) (2021/22).

such as Jordans & Ryvita, a health foods retailer,<sup>380</sup> and Syngenta, a leading agricultural company,<sup>381</sup> have engaged in similar practices to provide native habitat for pollinators.<sup>382</sup> These efforts, although not explicitly identifying pollination ecosystem services as a dependency, indicate an increasing corporate awareness of corporate dependencies on ecosystem services within their value chains.

**JLP's approach indicates that it may first recognise biodiversity risks implicitly, as potential reputational risks.** JLP does not mention pollinator decline as a risk in its 2022 annual report. However, it does list failure to live up to its ethics and sustainability ambition, which includes its approach to biodiversity, as a reputational risk that could affect trading performance.<sup>383</sup> To mitigate this risk, JLP has adopted a Responsible Sourcing Code of Practice, traceability systems and dedicated agricultural supply chains in key product categories.<sup>384</sup> Tracing of agricultural products is key to identifying dependencies on pollination ecosystem services. Combined with the company's acknowledgement that neglecting to consider pollinators has a potential to disturb its operations, supply chain tracing is likely to lead to explicit identification of pollinator decline as a corporate risk in the near future.

**Although JLP does not explicitly identify its biodiversity impacts, its corporate governance aligns with the boards' statutory obligation to consider the impacts of its corporate decisions on the environment, including biodiversity.** In its section 172(1) statement on how the board has had regard to the company's impacts on the environment, JLP's 2022 annual report does not mention impacts of the company on pollinators, or its biodiversity impacts. (For more on the section 172(1) statement see [Spotlight: United Kingdom](#)). However, the company considers the environment as a key stakeholder and recognises the potential negative impacts that raw materials used in its products have on the environment.<sup>385</sup> At the governance level, the board monitors the company's environmental impacts via the Ethics and Sustainability Committee and responds to environmental challenges that may impact the company's business.<sup>386</sup>

**Biodiversity impact and dependency assessment may help companies identify their biodiversity risks and opportunities, with emerging positive pollination impacts of cattle ranching on native prairies being a useful example of location- and ecosystem-specific nature of such opportunities.** Very much like impacts and dependencies, opportunities are likely to be location- and ecosystem-specific. While the cattle industry has the greatest negative biodiversity impacts at the production stage (due to land use and climate change impact of the upstream intensive agricultural activities),<sup>387</sup> grazing of cattle on a native prairie ecosystem enhances its biodiversity and pollinator habitat.<sup>388</sup> Other examples of opportunities created by identifying biodiversity dependencies and impacts are: JLP's discovery that the wool by-product of its lamb was being buried or burned, leading it to purchase the wool for a new, sustainable mattress range;<sup>389</sup> New York City saving billions of dollars in filtration costs by preserving and enhancing the natural function of the watershed's water purification ecosystem service;<sup>390</sup> and Jordans' brand differentiation through partnership with The Wildlife Trusts to develop bespoke habitats on 10 percent of each farm's land.<sup>391</sup>

<sup>380</sup> Cambridge Conservation Initiative, [The pollination deficit: Towards supply chain resilience in the face of pollinator decline](#) (2017).

<sup>381</sup> Syngenta, [Operation Pollinator Brochure](#) (2019)

<sup>382</sup> Sidhu and Joshi, *Frontiers in Plant Science*, [Establishing Wildflower Pollinator Habitats in Agricultural Farmland to Provide Multiple Ecosystem Services](#) (2016)

<sup>383</sup> John Lewis Partnership plc, [Annual Report and Accounts](#) (2022).

<sup>384</sup> John Lewis Partnership plc, [Annual Report and Accounts](#) (2022).

<sup>385</sup> John Lewis Partnership plc, [Annual Report and Accounts](#) (2022).

<sup>386</sup> John Lewis Partnership plc, [Annual Report and Accounts](#) (2022).

<sup>387</sup> Arcadis, [Corporate Biodiversity Footprint applied to a portfolio of Agri-Food companies](#) (2019).

<sup>388</sup> Cutter et al., [Cattle grazing results in greater floral resources and pollinators than sheep grazing in low-diversity grasslands](#) (13 January 2022); Canadian Agri-Food Policy Institute, [The Benefits of Cattle for Carbon Storage and Biodiversity in the Canadian Prairie](#) (March 2019); Birds Canada, [Livestock Producers are Powerful Allies for Grassland Birds](#) (27 April 2021).

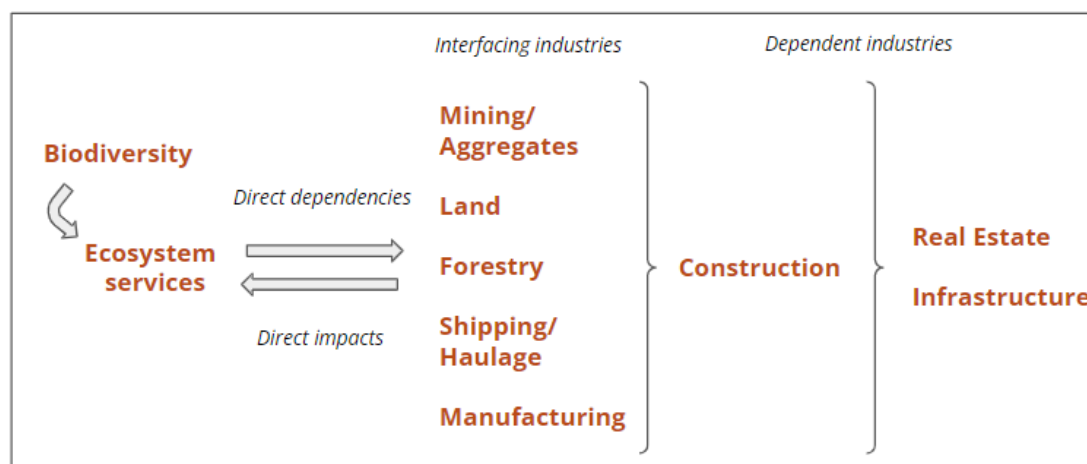
<sup>389</sup> John Lewis Partnership, [Ethics and Sustainability Report](#) (2021/22), 32.

<sup>390</sup> New York State, [New York City Watershed Program](#) (accessed 10 November 2022); Kenny, [Ecosystem Services in the New York City Watershed](#) (10 February 2006); New York Times, [A Billion Dollar Investment in New York's Water](#) (2018).

<sup>391</sup> Cambridge Conservation Initiative, [The pollination deficit: Towards supply chain resilience in the face of pollinator decline](#) (2017).

## Case study - the construction industry

**Figure 10: Construction value chain of biodiversity dependencies and impacts**



### 1 Global construction industry - facts

**The construction industry impacts on, and is impacted, by many other sectors.** The construction industry sits in the centre of a value chain, with inputs (raw materials and shipping), outputs (buildings and infrastructure) and their eventual demolition and waste.<sup>392</sup> Its dependencies and impacts are shared with sectors such as forestry, manufacturing, mining, aggregates, shipping, real estate and every sector that uses end products (including financiers, developers, owners and users of real estate).<sup>393</sup> The construction industry serves almost all industries, since most economic value is created within “constructed assets”.<sup>394</sup>

**The construction industry is the world’s biggest consumer of raw materials and is rapidly growing.** The global construction market is expected to reach 13.5% of global GDP by 2030, with over half that growth attributed to China, India, US, and Indonesia, which are countries all extremely rich in biodiversity.<sup>395</sup> The construction industry is the world’s largest consumer of raw materials,<sup>396</sup> the use of which is projected to more than double between 2011 and 2060.<sup>397</sup> Raw materials are often sourced from mining, extractives and forestry.<sup>398</sup> In 2020 non-metallic minerals (sand, gravel and limestone), used mainly in construction, accounted for most of the world’s anthropogenic mass and outweighed Earth’s living biomass.<sup>399</sup>

<sup>392</sup>One Planet network and International Resource Panel, [Analysis of the Construction Value Chain Understanding the value chain & identifying hotspots](#) (2021) 2,

<sup>393</sup> Carbon Pricing Leadership Coalition and World Bank International Finance Corporation, [Construction Industry Value Chain: How Companies Are Using Carbon Pricing to Address Climate Risk and Find New Opportunities](#) (2018) 7.

<sup>394</sup> World Economic Forum, [Shaping the Future of Construction: A Breakthrough in Mindset and Technology](#) (2016), 9.

<sup>395</sup> Statista, [Size of the global construction market in 2021, with forecasts from 2021 to 2030](#) (accessed 10 November 2022); Oxford Economics Ltd, [Future of Construction: A Global Forecast for Construction to 2030](#) (2021).

<sup>396</sup> Carbon Pricing Leadership Coalition and World Bank International Finance Corporation, [Construction Industry Value Chain: How Companies Are Using Carbon Pricing To Address Climate Risk And Find New Opportunities](#) (2018) 4; World Economic Forum, [Shaping the Future of Construction: A Breakthrough in Mindset and Technology](#) (2016).

<sup>397</sup> OECD, [Global Material Resources Outlook to 2060 Economic drivers and environmental consequences](#) (2018) 3; UNEP and International Resource Panel, [Global Resources Outlook 2019](#) (2019) 44, 111.

<sup>398</sup> One Planet network and International Resource Panel, [Analysis of the Construction Value Chain Understanding the value chain & identifying hotspots](#) (2021) 3-4; ProEst, [The 5 most common construction materials](#) (accessed 10 November 2022); MT Copeland, [Five Building Materials Commonly Used in Construction](#) (2 July 2020); University of Texas at Austin, Cockrell School of Engineering, [Infrastructure Materials Engineering](#) (accessed 10 November 2022); Mr Son Quang Pham and Dr Michael Burrow, [Material Requirements for Infrastructure Development](#) (February 2018).

<sup>399</sup> Torres et al, [Unearthing the global impact of mining construction minerals on biodiversity](#) (2022); Elhacham et al., R. Global human-made mass exceeds all living biomass. *Nature* 588, 442–444 (2020).

Construction also uses natural resources such as land (for materials extraction and building upon), water (for construction and occupation) and fossil fuels.<sup>400</sup>

## 2 The corporate interface with biodiversity through the construction sector's dependencies

**The construction industry is one of the most dependent on nature directly through many ecosystem services and indirectly through half of its supply chain.** All of the construction industry's direct gross value added (GVA) and almost half of its supply chain's GVA is highly dependent on nature, with a further third of its supply chain having medium dependence.<sup>401</sup> The industry depends highly on ecosystem services including climate regulation, flood mitigation, soil and sediment retention and water supply.<sup>402</sup> The mining industry, on which construction depends for raw materials, has a very high direct dependency upon nature via water flow regulation, water supply, climate regulation and soil and sediment retention.<sup>403</sup>

### Figure 11 - Provenance of construction materials<sup>404</sup>

- A) Concrete (made from aggregates such as gravel and sand, cement, water, and burnt lime. The construction sector uses about 65% of all aggregates extracted globally.<sup>405</sup>)
- B) Cement (made of limestone, clay, shells, chalk, shale, slate, silica sand, blast furnace slag or iron ore and gypsum).
- C) Asphalt (or bitumen): used in transport infrastructure, composed of petroleum and aggregates.
- D) Metals: steel, aluminium, copper, etc (the construction sector uses about 15% of total ferrous metals and 3% of non-ferrous metals extracted globally.<sup>406</sup>)
- E) Brick, stone and earth (bricks made from sand, clay, shale or concrete, lime, magnesia and iron oxide, other masonry made from stone.)
- F) Timber and wood-based materials (about two-thirds of world forests are extensively used<sup>407</sup>).
- G) Chemicals, glass, plastics, alternative local materials (sugar cane bagasse, bamboo, typha, etc.)<sup>408</sup>

<sup>400</sup>One Planet network and International Resource Panel, [Analysis of the Construction Value Chain Understanding the value chain & identifying hotspots](#) (2021); UNEP and International Resource Panel, [Global Resources Outlook 2019](#) (2019).

<sup>401</sup> World Economic Forum, [Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy](#) (2020) 14.

<sup>402</sup> Data taken from the ENCORE database. The Australian Conservation Foundation, [The nature-based economy: How Australia's prosperity depends on nature](#) (2022), 42.

<sup>403</sup> Data taken from the ENCORE database. The Australian Conservation Foundation, [The nature-based economy: How Australia's prosperity depends on nature](#) (2022), 42.

<sup>404</sup> One Planet network and International Resource Panel, [Analysis of the Construction Value Chain Understanding the value chain & identifying hotspots](#) (2021) 3-4; ProEst, [The 5 most common construction materials](#) (accessed 10 November 2022); MT Copeland, [Five Building Materials Commonly Used in Construction](#) (2 July 2020); University of Texas at Austin, Cockrell School of Engineering, [Infrastructure Materials Engineering](#) (accessed 10 November 2022); Mr Son Quang Pham and Dr Michael Burrow, [Material Requirements for Infrastructure Development](#) (February 2018).

<sup>405</sup> One Planet network and International Resource Panel, [Analysis of the Construction Value Chain Understanding the value chain & identifying hotspots](#) (2021) 5; OECD, [Global Material Resources Outlook to 2060 Economic drivers and environmental consequences](#) (2018).

<sup>406</sup> One Planet network and International Resource Panel, [Analysis of the Construction Value Chain Understanding the value chain & identifying hotspots](#) (2021) 5; OECD, [Global Material Resources Outlook to 2060 Economic drivers and environmental consequences](#) (2018).

<sup>407</sup> UNEP and International Resource Panel, [Global Resources Outlook 2019](#) (2019) 61.

<sup>408</sup> One Planet network and International Resource Panel, [Analysis of the Construction Value Chain Understanding the value chain & identifying hotspots](#) (2021) 3-4; ProEst, [The 5 most common construction materials](#) (accessed 10 November 2022); MT Copeland, [Five Building Materials Commonly Used in Construction](#) (2 July 2020); University of Texas at Austin, Cockrell School of Engineering, [Infrastructure Materials Engineering](#) (accessed 10 November 2022); Mr Son Quang Pham and Dr Michael Burrow, [Material Requirements for Infrastructure Development](#) (February 2018).

**Construction depends on flood prevention ecosystem services, among others.** Biodiverse ecosystems provide a network of vegetation that absorbs water and holds soils in place, while healthy and well-functioning coastal barrier ecosystems can lessen storm surge and attenuate wave energy.<sup>409</sup> Both act as flood mitigation prevention mechanisms. The root system of vegetation in soil creates pores via which water is absorbed, helping the ground to absorb excessive rainwater and preventing flash floods.<sup>410</sup> Mangroves, for example, act as coastal barriers to storm surges due to complex trunk and root structures which weaken water velocity and accumulate sediments, contributing to soil stability. Mangroves have a unique ability to thrive in waters of varying salinity, alternately flooded or exposed to air, where other trees would die.<sup>411</sup>

**Mining relies on biodiversity-dependent soil and sediment retention, soil quality regulation and water supply.** Stability of soil allows for steeper slopes in open pit mines, which result in lower waste. Soil degradation,<sup>412</sup> leading to loss of soil quality and erosion, can increase a mine's design costs and sometimes risk of landslides. This dependency of the mining industry on the ecosystem service of soil quality regulation is prevalent in South Africa, which has severe soil degradation.<sup>413</sup> Mining is also dependent on water supply, used for exploration, extraction, processing, and pumping.<sup>414</sup> Over 45% of the world's mining operations are located in regions of high or extreme water stress, with water shortages preventing expansion of global mining activities.<sup>415</sup> A survey of mining executives ranked water as a top ESG issue.<sup>416</sup> Reputational water risk is often higher than physical or regulatory risk, as mining can impact water supply of local communities.<sup>417</sup>

### 3 *The corporate interface with biodiversity through the construction sector's impacts*

**Impacts of construction occur through land and energy use and supply of raw materials.** Construction contributes to biodiversity loss and species extinction at building sites through habitat loss, reduction and degradation of ecosystems, but also through energy use, light pollution and wastewater during use of buildings and waste at demolition stage.<sup>418</sup> There are also significant hidden impacts in the supply chain of raw materials.<sup>419</sup> The construction industry's contribution to climate change, a key driver of biodiversity loss, is well publicised. The industry accounts for over a third of global greenhouse emissions.<sup>420</sup>

**Construction minerals (sand, gravel, limestone) are the most extracted solid raw materials.**<sup>421</sup> They account for most of the world's anthropogenic mass. Their extraction impacts over 24,000 animal and plant species including over a thousand species in the Red List of Threatened Species maintained by The

<sup>409</sup> Flora and Fauna International, [Stripping nature: floods and biodiversity](#) (accessed 10 November 2022); Asian Development Bank, [Managing the Perfect Storm: How Healthy Ecosystems Increase Resilience](#) (2018)

<sup>410</sup> Woodland Trust, [Can trees and woods help reduce flooding?](#) (accessed 10 November 2022).

<sup>411</sup> Marois and Mitsch, International Journal of Biodiversity Science, Ecosystem Services & Management, [Coastal protection from tsunamis and cyclones provided by mangrove wetlands – a review](#) (2015); Vannucci, Brazilian Journal of Ecology, [What is so special about mangroves?](#) (2001); Howai, University of Reading, [Regulating and cultural services of mangroves](#) (2019).

<sup>412</sup> Land conversion such as intensive farming, deforestation or clearing of vegetation could, for example, cause this.

<sup>413</sup> Natural Capital Finance Alliance and PricewaterhouseCoopers, [Integrating Natural Capital In Risk Assessments: A step-by-step guide for banks](#) (2018) 25. This could be caused by land change, excessive agriculture and agricultural runoff such as phosphorus and nitrogen.

<sup>414</sup> IEA, [Reducing the impact of extractive industries on groundwater resources](#) (2022).

<sup>415</sup> PwC for the World Economic Forum, [Bio-positive Strategies for Sustainable Business Growth](#) (2011) 12. Water Stress Index 2011. Water stress is evaluated at 50km<sup>2</sup> resolution.

<sup>416</sup> EY, Top 10 business risks and opportunities for mining and metals in 2023 (2022) 8

<sup>417</sup> WWF, Water Risk Filter Research Series: An Analysis of Water Risk in The Mining Sector (2020) 13; EY, Top 10 business risks and opportunities for mining and metals in 2023 (2022) 8.

<sup>418</sup> One Planet network and International Resource Panel, [Analysis of the Construction Value Chain Understanding the value chain & identifying hotspots](#) (2021) 6-8; UNEP and International Resource Panel, [Global Resources Outlook 2019](#) (2019) 24.

<sup>419</sup> One Planet network and International Resource Panel, [Analysis of the Construction Value Chain Understanding the value chain & identifying hotspots](#) (2021) 6-8.

<sup>420</sup> UN Environment Programme, [The Global Status Report for Buildings and Construction](#) (2022)

<sup>421</sup> Non-metallic minerals (used primarily in construction) account for 65 per cent of total resource extractions: UNEP and International Resource Panel, [Global Resources Outlook 2019](#) (2019) 111.

International Union for Conservation of Nature, a majority of which are threatened with extinction.<sup>422</sup> Impacts of mining can include decrease in habitat and habitat fragmentation through land use change, infrastructure, chemical, water, noise and light pollution.<sup>423</sup> Construction mining has contributed to four known species extinctions and takes place in ecosystems whose biodiversity is crucial.<sup>424</sup> Life-cycle analysis of seven metals (iron, aluminium, copper, zinc, lead, nickel and manganese) and three construction materials (concrete, and sand and gravel) shows a wide range of significant environmental consequences, including acidification, climate change, eutrophication, land use, ozone layer depletion, photochemical oxidation, and aquatic and terrestrial ecotoxicity.<sup>425</sup>

**Iron ore is a major raw material in construction, which can have significant biodiversity impacts.** One of the most used metals worldwide is iron ore, of which 98% is used in steel.<sup>426</sup> Construction accounts for over 50% of global steel demand.<sup>427</sup> The impacts of iron ore mining include habitat degradation and species loss arising from land use change and pollution, and downstream climate impacts of manufacturing.<sup>428</sup>

**Impacts and value creation relating to natural resource extraction are unequally distributed worldwide, with high-income regions outsourcing environmental impacts of their consumption to other regions.**<sup>429</sup> For example, many land use impacts of resource extraction occur in regions with high biodiversity and species loss, such as Indonesia, the Philippines, Brazil, Africa and Latin America, driven by increasing demand and depletion of easily accessible reserves.<sup>430</sup> This resource extraction is often driven by demand originating in richer parts of the world. The biodiversity impacts of wood extraction depend largely on the intensity of forest management. Intensive forestry can cause a loss of up to 50% of local species, and these biodiversity impacts are much higher in tropical regions than in Europe, since only 8% of forests worldwide are certified as sustainably managed, the majority of which are in Europe and North America.<sup>431</sup>

**Shipping of construction materials also contributes to biodiversity impacts.** The shipping industry is responsible for the carriage of around 90% of world trade, dominated by dry materials, a large part of which is iron ore and steel.<sup>432</sup> Nearly 1 billion tons of iron ore is shipped annually.<sup>433</sup> Impacts of shipping include underwater noise pollution, emissions including sulphur and nitrogen. Nitrogen contributes to eutrophication (excessive richness of nutrients, causing overly dense plant growth, indirectly impacting biodiversity) and dumping of ballast which introduces invasive species.<sup>434</sup> Ballast is sea water used by ships to replace cargo unloaded at port, to maintain stability. When they arrive at the next port for cargo, they discharge millions of litres of ballast (billions of tonnes globally each year), containing as many as 10,000

<sup>422</sup> Torres et al, [Unearthing the global impact of mining construction minerals on biodiversity](#) (2022); UNEP and International Resource Panel, [Global Resources Outlook 2019](#) (2019) 44, 68; OECD, [Global Material Resources Outlook to 2060: Economic Drivers and Environmental Consequences](#) (2018).

<sup>423</sup> IUCN, [Guidelines for planning and monitoring corporate biodiversity performance](#) (2021) 15.

<sup>424</sup> Torres et al, [Unearthing the global impact of mining construction minerals on biodiversity](#) (2022).

<sup>425</sup> OECD, [Global Material Resources Outlook to 2060 Economic drivers and environmental consequences](#) (2018) 18.

<sup>426</sup> Bechtel, [Iron Ore -The backbone of industry](#) (accessed 10 November 2022); BHP, [Iron ore](#) (accessed 10 November 2022); BHP, [What is Iron Ore?](#) (accessed 10 November 2022).

<sup>427</sup> World Steel Association, [Steel in buildings and infrastructure](#) (accessed 10 November 2022); Aytekin & Mardani, Transportation Research Record Journal of the Transportation Research Board, Sustainable Materials: A Review of Recycled Concrete Aggregate Utilization as Pavement Material (2022), [Figure 1: The proportion of materials used for the construction of a building](#); ProEst, [The 5 most common construction materials](#) (accessed 10 November 2022).

<sup>428</sup> European Commission and UNEP-WCMC, [Application of the Biodiversity Indicators for Site-based Impacts methodology to Anglo American's Kolomela open-cast iron ore mine](#), South Africa (2019); European Commission and Iceberg Data Lab, [Corporate Biodiversity Footprint applied to a Mining Company](#) (2019).

<sup>429</sup> UNEP and International Resource Panel, [Global Resources Outlook 2019](#) (2019) 65

<sup>430</sup> UNEP and International Resource Panel, [Global Resources Outlook 2019](#) (2019) 93

<sup>431</sup> UNEP and International Resource Panel, [Global Resources Outlook 2019](#) (2019) 90

<sup>432</sup> International Chamber of Shipping, [Shipping and World Trade: World Seaborne Trade](#) (accessed 10 November 2022); Rodrigue, J-P, The Geography of Transport Systems, Fifth Edition, [World Seaborne Trade by Cargo Type, 1970-2021](#) (2020); UNCTAD, [Review of Maritime Transport 2021](#) (2021) 13-14

<sup>433</sup> International Chamber of Shipping, [Shipping and world trade: driving prosperity](#) (accessed 10 November 2022).

<sup>434</sup> European Maritime Spatial Planning Platform, [Maritime transport and marine conservation](#) (2021); [Conflicting interests study: Maritime Transport and Area-Based Marine Conservation](#).

species, including bacteria, viruses, crabs and fish, which can disrupt the balance of ecosystems and wipe out native species.<sup>435</sup>

#### 4 *Corporate recognition of dependencies, impacts, risks and opportunities arising from the construction industry*

**It is rare for any construction or mining company to explicitly acknowledge dependencies on ecosystem services in company reports.** However, some companies tacitly acknowledge dependencies and biodiversity risk, by recognising essential natural resource scarcity, risks of lost opportunity or reputational damage and the social licence upon which they operate, which incentivises mitigation of environmental impacts.

- **Identifying natural resources as essential (tacitly recognising dependency):** French construction multinational Vinci SA (**Vinci**) recognises natural resources as essential to business,<sup>436</sup> listing significant consumption of raw materials and associated waste as principal risks.<sup>437</sup> Multinational Bouygues Construction (**Bouygues**) ranks biodiversity loss as a key concern, acknowledges resource scarcity and considers environmental issues strategic.<sup>438</sup> Skanska UK uses the Natural Capital Protocol to understand risks and opportunities and plans to evaluate its nature dependencies<sup>439</sup> and Mexican multinational Cemex recognises that biodiversity loss has increased resource constraints for the cement industry.<sup>440</sup>
- **Identifying risks of lost opportunities or reputational damage:** Bouygues considers that failure to address environmental responsibility could result in lost opportunities and reputational damage.<sup>441</sup> Cemex aims to address environmental issues to meet stakeholder expectations.<sup>442</sup> Global mining company Anglo American identifies the environment as likely to influence its strategic context.<sup>443</sup>
- **Acknowledging that biodiversity issues link to social licence to operate:** Cemex acknowledges that failure to secure buy-in from consumers and communities in relation to biodiversity could prevent its operations.<sup>444</sup> Anglo American acknowledges its reliance on the social licence and that society places importance on mitigating environmental impacts (including biodiversity). Skanska AB (**Skanska**), rates biodiversity as medium risk to stakeholders and high importance for customers.<sup>445</sup>

These indirect acknowledgements of dependency or potential risk arising from biodiversity impacts shows that directors of those companies recognise the materiality of biodiversity loss to their companies.

**Construction and mining companies are more forthcoming in acknowledging their impacts on biodiversity,** the risks associated with those impacts and solutions to mitigate them. Some mention stewardship, recognising their obligations in relation to protecting, conserving and restoring biodiversity.

<sup>435</sup> British Ecological Society, [Breaking down the ballast water problem](#) (2014); NCBI, [Guide to Ship Sanitation. 3rd edition, Ballast Water](#) (2011); Clear Seas, [Ballast water management: stopping the spread of invasive species by ships](#) (accessed 10 November 2022).

<sup>436</sup> Vinci, [Sustainability](#), Extract From The 2021 Universal Registration Document (2022), 25. Vinci, [2021 Workforce-Related, Environmental And Social Information, Extract From The 2021 Universal Registration Document](#) (2022)

<sup>437</sup> Vinci, [2021 Workforce-Related, Environmental And Social Information](#), Extract From The 2021 Universal Registration Document (2022) 174, 221-226, 251.

<sup>438</sup> Bouygues Construction, [2021 Universal Registration Document](#) (2022) 8, 153; [2021 Financial Report](#) (2022) 13, 17.

<sup>439</sup> Capitals Coalition, [Natural Capital Protocol: Case Study for Skanska](#) (2017).

<sup>440</sup> Business Action on Climate + Nature, [Focus on CEMEX](#) (2021).

<sup>441</sup> Bouygues Construction, [2021 Universal Registration Document](#) (2022) 8, 153; [2021 Financial Report](#) (2022) 13, 17.

<sup>442</sup> Business Action on Climate + Nature, [Focus on CEMEX](#) (2021).

<sup>443</sup> Anglo American plc, [Integrated Annual Report 2021](#) (2022), 15, 17, 18, 20, 38.

<sup>444</sup> Business Action on Climate + Nature, [Focus on CEMEX](#) (2021).

<sup>445</sup> Skanska, [Annual and Sustainability Report 2021](#) (2022) 89.



- **Identifying biodiversity as a topic of concern:** Skanska listed negative environmental impacts among its top risks, including harm to ecosystems and resource consumption<sup>446</sup> and German multinational construction group Hochtief acknowledged biodiversity as a material topic for its business.<sup>447</sup>
- **Identifying the company's biodiversity impacts:** Vinci identified its group's potentially significant impact on natural environments as a material issue.<sup>448</sup> It mitigates this by building wildlife crossings (bridges or underpasses) for habitat connectivity at motorways.<sup>449</sup> Construction creates barriers between patches of land, preventing animals from finding shelter, food, water, nesting and transferring nutrients, seeds, and microbes. This creates "islands" of habitat that can cause local extinctions of species and inhibit long term population viability.<sup>450</sup> Linking habitats helps to restore and preserve biodiversity. Vinci has also reduced use of phytosanitary products and pledged to cease all use by 2030.<sup>451</sup> Phytosanitary products include pesticides, which can have a significant negative effect on biodiversity.<sup>452</sup> Bouygues identifies impacts of its construction businesses on biodiversity as including loss of greenfield sites, destruction of habitats and species, dissemination of invasive species and pollution.<sup>453</sup> Anglo-American reports on biodiversity impacts using the GRI framework.<sup>454</sup> Hochtief recognises its projects' impact on the main drivers of biodiversity loss.<sup>455</sup>
- **Acknowledging their obligation to mitigate impacts or to protect or conserve biodiversity:** Bouygues aims to reduce pressure from land-use change through restoring nature, combat spread of invasive species and limit pollution.<sup>456</sup> Hochtief states its "*clear obligation to protect, conserve, or restore ecosystems and biodiversity through the efficient use of natural resources*".<sup>457</sup> Anglo American views itself as a steward, aiming to minimise impact and deliver positive environmental outcomes.<sup>458</sup>

This recognition by companies of their impacts and role in relation to mitigating impacts and preventing biodiversity loss shows that directors of those companies recognise the materiality of biodiversity impacts to the long-term success of their business, in terms of both risk and opportunity.

**Many global construction and mining companies are using biodiversity targets as opportunities** for marketing and business creation, for example, through broad public statements and goals, embedding within risk and opportunity assessment, strategy and innovation partnerships.

- **Broad public statements and goals:** Vinci discusses "*turning risk management into opportunity*" by integrating biodiversity into governance and management,<sup>459</sup> to create environmental, social and economic value.<sup>460</sup> Skanska UK cites positive legacy through creating biodiversity net gain.<sup>461</sup> Hochtief

<sup>446</sup> Skanska, [Annual and Sustainability Report 2021 \(2022\)](#) 62, 85.

<sup>447</sup> Hochtief, [Hochtief commitment to biodiversity and ecosystems - Position Paper](#) (2022).

<sup>448</sup> Vinci, [Duty Of Vigilance Plan, Extract From The 2021 Universal Registration Document](#) (2022) 251; Vinci, [2021 Workforce-Related, Environmental And Social Information, Extract From The 2021 Universal Registration Document](#) (2022) 174.

<sup>449</sup> Vinci, [2021 Workforce-Related, Environmental And Social Information, Extract From The 2021 Universal Registration Document](#) (2022) 225, 229-233; Vinci, [Preserving Natural Environments](#) (accessed 10 November 2022).

<sup>450</sup> Teitelbaum et al, *Movement Ecology, Urban specialization reduces habitat connectivity by a highly mobile wading bird* (2020); The Heart of England Forest, [Why are wildlife corridors important?](#) (2020); Rob Dunn, *A Natural History of the Future: What the Laws of Biology Tell Us About the Destiny of the Human Species*, ISBN-10 : 1399800132 (2021).

<sup>451</sup> Vinci, [Duty Of Vigilance Plan, Extract From The 2021 Universal Registration Document](#) (2022).

<sup>452</sup> Geiger et al, [Basic and Applied Ecology, Persistent negative effects of pesticides on biodiversity and biological control potential on European farmland](#) (2010); Oosthoek S, [Pesticides spark broad biodiversity loss](#), *Nature* (2013); Gunstone et al, [Pesticides and Soil Invertebrates: A Hazard Assessment](#), *Frontiers in Environmental Science* (2021).

<sup>453</sup> Bouygues Construction, [2021 Universal Registration Document](#) (2022) 174.

<sup>454</sup> Anglo American plc, [Sustainability Report 2021](#), 77, 80.

<sup>455</sup> Hochtief, [Hochtief commitment to biodiversity and ecosystems - Position Paper](#) (2022).

<sup>456</sup> Bouygues Construction, [2021 Financial Report](#) (2022) 7, 13; Bouygues Construction, [2021 Universal Registration Document](#) (2022) 4.

<sup>457</sup> Hochtief, [Hochtief commitment to biodiversity and ecosystems - Position Paper](#) (2022).

<sup>458</sup> Anglo American plc, [Sustainability Report 2021](#), 8, 12, 37.

<sup>459</sup> Act4nature International and Vinci, [Vinci's individual commitments proposal to act4nature international](#) (2020)

<sup>460</sup> Vinci, [2021 Workforce-Related, Environmental And Social Information, Extract From The 2021 Universal Registration Document](#) (2022), 174, 203, 205, 208, 209, 210, 226, 230-232.

<sup>461</sup> Skanska, [Environmental Management - Biodiversity](#) (23 January 2017).

aims to operate “*in nature, but also for nature*”<sup>462</sup> referencing environmental protection in strategic terms.

- Risks and opportunities assessment and strategic planning:** Many companies use partnerships for innovation.<sup>463</sup> Bouygues partnered with WWF in relation to forest and solar farm biodiversity and with research partners to develop bio-based materials.<sup>464</sup> Anglo-American partners with civil society organisations to deliver its biodiversity commitments.<sup>465</sup> Hochtief plans to use the TNFD framework,<sup>466</sup> implement biodiversity management plans and long-term biodiversity initiatives.<sup>467</sup> Cemex assigns monetary value to environmental data in its annual report.<sup>468</sup> Anglo American aims to deliver net-positive biodiversity across all operations through changing the full mining lifecycle.<sup>469</sup> For some companies these opportunities involve shifts in income streams. Vulcan Materials Corporations pivoted from aggregate extraction to selling habitat credits in response to an endangered Delhi Sands flower-loving fly.<sup>470</sup> Anglo American shifted from mining coal to copper (batteries) and polyhalite (organic fertiliser).<sup>471</sup>
- On-site biodiversity measures:** Quarry conservation is a trendy way to mitigate impacts and improve public image. Bouygues uses ecological niches, tree planting, biodiversity education and monitoring.<sup>472</sup> Rio Tinto protects biodiversity in forests around its mine to mitigate biodiversity risks.<sup>473</sup> Lafarge Holcim shifted from planting pine tree monocultures at retired quarries to longer term optimisation of habitats, and measures the resulting increase in monetary value of ecosystem services.<sup>474</sup> Cemex worked with BirdLife International to identify quarries with high conservation value.<sup>475</sup> Another common innovation opportunity is “recycling” industrial wastelands, using sustainable construction and reducing soil sealing (by using already developed land, this avoids sealing soils in other areas).<sup>476</sup>

All the above examples illustrate the significant, real and tangible interfaces between the construction and mining sectors and nature, and how this can lead to hidden dependencies, impacts, risks and opportunities for companies up and down the value chain.

<sup>462</sup> Hochtief, [Sustainability Plan 2025](#) (2022).

<sup>463</sup> Vinci, [2021 Workforce-Related, Environmental And Social Information, Extract From The 2021 Universal Registration Document](#) (2022), 174, 203, 205, 208, 209, 210, 226, 230-232.

<sup>464</sup> Bouygues Construction, [2021 Financial Report](#) (2022) 11-13; [2021 Universal Registration Document](#) (2022) 162, 173, 176.

<sup>465</sup> Anglo American plc, [Sustainability Report](#) 2021, 37.

<sup>466</sup> Hochtief, [Hochtief commitment to biodiversity and ecosystems - Position Paper](#) (2022).

<sup>467</sup> Hochtief, [Hochtief commitment to biodiversity and ecosystems - Position Paper](#) (2022).

<sup>468</sup> Business Action on Climate + Nature, [Focus on CEMEX](#) (2021).

<sup>469</sup> Anglo American plc, [Sustainability Report](#) 2021, 4, 5, 8-10, 35, 37; United Nations Environment Finance Initiative, [Are you ready for nature-related disclosure? An assessment of readiness and expectations from the corporate market](#) (2022) 34-35.

<sup>470</sup> PwC for the World Economic Forum, [Bio-positive Strategies for Sustainable Business Growth](#) (2011) 7 ; Bayon, R, [Banking on Biodiversity, State of the World: Innovations for a sustainable economy](#), The Worldwatch Institute (2008).

<sup>471</sup> Anglo American plc, [Integrated Annual Report 2021](#) (2022), 18, Anglo American plc, [Sustainability Report](#) 2021, 4, 27, 33, 34.

<sup>472</sup> Bouygues Construction, [2021 Universal Registration Document](#) (2022) 174-175.

<sup>473</sup> PwC for the World Economic Forum, [Bio-positive Strategies for Sustainable Business Growth](#) (2011) 13; Information from Rio Tinto.

<sup>474</sup> European Commission and Ecoacs, [Biodiversity and Ecosystem Services valuation and accounting tool associated with quarry restoration works by Lafarge Holcim](#) (2019).

<sup>475</sup> Business Action on Climate + Nature, [Focus on CEMEX](#) (2021).

<sup>476</sup> Bouygues Construction, [2021 Universal Registration Document](#) (2022) 175; Vinci, [2021 Workforce-Related, Environmental And Social Information, Extract From The 2021 Universal Registration Document](#) (2022) 225, 229-233.

### Table - multi-sector examples of company interfaces with nature

These illustrative examples are all taken from company reports or studies on companies and sectors.

Sector	Dependencies and Impacts	Risks and Opportunities
Consumer goods <sup>477</sup>	Potential land use change to supply palm oil, paper, tea, soy, and cocoa. Dependence on forest, soil and agriculture related ecosystem services. Entire value chain dependent on climate regulation.	Transition risk through land use regulation. Extreme weather events could significantly disrupt value chains. Sustained elevated temperatures could lead to reduced crop outputs due to reduced soil productivity, translating into higher raw material prices.
Cosmetics <sup>478</sup>	Forest ecosystem services supply shea butter and argan oil, among other natural ingredients. 80% of one company's ingredients is derived from plants, some of which are deforestation or land-conversion sensitive.	Many trees and plants supplying ingredients are vulnerable. Degradation of forests can threaten the availability and longer-term security of valuable commodities on which the €200 billion global cosmetics market depends.
Fashion <sup>479</sup>	High dependence on natural commodities, including animal fibres, metal, cashmere, cotton and elastan. Production depends on water ecosystem services  Leather has land-use conversion impacts. Cotton production uses insecticides, contributing to pollinator decline. Shipping and transport of materials creates GHG emissions and spreads invasive species. Production, manufacturing and retail contribute to the drivers of biodiversity loss, through GHG emissions, waste, water consumption and water pollution.	Operational risks through supply of water. Biodiversity can rate highly in terms of consumer and stakeholder expectations and therefore impacts can create reputational risk and reduce sales value. High dependence on natural raw materials creates risks where material supply is disrupted as a result of biodiversity loss.  Opportunities may include investing in restoring biodiversity within and outside the supply chain, sustainable farming methods, systemic change throughout the supply chain including better traceability and due diligence, finding more sustainable product lines and investing in circular economy initiatives.

<sup>477</sup> Unilever, [Annual report and Accounts](#) (2021) 30, 52, 59, 60.

<sup>478</sup> World Economic Forum, [Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy](#) (2020) 20-21; L'Oréal, [Cosmetics market](#) (2018).

<sup>479</sup> Capitals Coalition, [Biodiversity Guidance to Accompany the Natural Capital Protocol: Application by MUD Jeans International B.V.](#) (Last accessed 10 November 2022). Cambridge Institute for Sustainability Leadership (CISL), [Developing a Corporate Biodiversity Strategy](#) (2020); Kering, [Environmental Profit & Loss \(EP&L\) 2021 Group Results](#) (2022); Kering, [Biodiversity Strategy](#) (2020)

Sector	Dependencies and Impacts	Risks and Opportunities
Fisheries <sup>480</sup>	Fish farms impact on biodiversity, including through habitat destruction, affecting geochemical and biological cycles through pollution, contamination (including marine eutrophication caused by nitrogen) and spread of invasive species. Unsustainable ingredients are used in feed (e.g., deforestation for soy production). Fishing and seafood farming are wholly dependent on nature through 18 ecosystem services, providing clean water; oxygen, currents and water temperature.	Regulatory, reputational, market, physical and operational risks caused by impacts. Reduction of nature-related risks and impacts is an opportunity to reduce seafood producers' costs and increase company profitability.  Ocean pollution may drive unpredictable disruption to fish stocks in the near term and result in more systemic declines in future, causing significant economic losses.
Food and beverages (including examples of beef and dairy, soy, coffee, chocolate, flour, soft drinks and alcohol) <sup>481</sup>	Food systems are the largest driver of deforestation, water use, biodiversity loss and soil degradation. Food production (through goods and services derived from nature) shares the same dependencies as agriculture, including on habitats, species, genetic material, water supply, pollination and soil quality.	The impacts of livestock farming on the ecosystems upon which it depends have implications for maintaining and improving food production to meet the world's needs. Dairy farming provides nourishment for almost every person on Earth. The global market was worth nearly \$830 billion in 2020. Acute physical risks include pest outbreaks, biodiversity loss, flooding, drought, and water and soil pollution, causing direct damage to farms, disruption to supply chains, often felt at speed and magnitude. The food system, with

<sup>480</sup> WWF, Storebrand, NINA & Grieg Seafood, [Nature-related risk reporting for investors: A case study of the aquaculture sector](#) (2022); UNEPFI, [Turning the tide: how to finance a sustainable ocean recovery](#) (2021); United Nations Environment – Finance Initiative, [Are you ready for nature-related disclosure? An assessment of readiness and expectations from the corporate market](#) (2022) 37; European Commission, [Farmed salmon production: what are the main impacts on biodiversity? A generic case study with the Product Biodiversity Footprint](#) (2019); Natural Capital Finance Alliance and PricewaterhouseCoopers, [Integrating Natural Capital In Risk Assessments: A step-by-step guide for banks](#) (2018) 24.

<sup>481</sup> [Agriculture case study](#); WWF, [Bringing It Down To Earth: Nature Risk and Agriculture](#) (2021); Moody's Investors Service, [Corporates – Latin America & Caribbean Deforestation intensifies reputational risk for companies operating in Brazil](#) (2021); Robeco and University of Cambridge Institute for Sustainability Leadership, [How soil degradation amplifies the financial vulnerability of listed companies in the agricultural value chain](#) (2022); The Australian Conservation Foundation, [The nature-based economy: How Australia's prosperity depends on nature](#) (2022), 42; University of Cambridge Institute for Sustainability Leadership (CISL), [Modelling better business: Nestlé trials natural capital premium with UK dairy farmers](#) (2018); UN Food and Agriculture Organization, [Livestock and Landscapes](#) (2012); European Commission and Plansup, [Application of the Biodiversity Footprint Methodology for the Dutch dairy sector](#) (2018); Statista, The Statistics Portal, [Dairy market value worldwide in 2020 and 2026](#) (accessed 10 November 2022); European Commission and Plansup, [Application of the Biodiversity Footprint Methodology for the production of a chocolate bar of Tony's Chocolonely](#) (2019); European Commission, [Assessing Asda's instant coffee supply chains using the Biodiversity Impact Metric](#) (2020); World Economic Forum, [Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy](#) (2020) 14; Financial Times, [Rhine's low water level blights German industry](#) (2022) (last accessed 9 November, 2022); Suntory, [Sustainability](#) (last accessed 10 November, 2022); Suntory, [Disclosures Based on Task Force on Climate-related Financial Disclosures \(TCFD\) Recommendations](#) (last accessed 10 November, 2022); Suntory, [Sustainability: Water](#) (last accessed 10 November, 2022). Diageo, [Annual Report](#) (2020) 28, 32, 39.

Sector	Dependencies and Impacts	Risks and Opportunities
	<p>Specific examples include the flour industry's dependence on ecosystem services that regulate river levels, to enable transport of flour from grain-processing factories, and the drinks industry's dependence on forest ecosystem services for plant ingredients, water supply and water purification</p> <p>Cattle and soybean occupy the largest areas of states in Brazil with high deforestation rates. They are the main drivers of deforestation in the Amazon and Cerrado biomes. Deforestation and land use conversion contributes to soil degradation. Livestock farming is one of the biggest drivers of global land use change. Conversion of 13 billion hectares of forest annually for pasture or to grow feed impacts water availability, soil quality, biodiversity and climate change. The production of cocoa and sugar for chocolate, and coffee, has a high biodiversity footprint through land use change, pollution (including through fertilisers and pesticides), GHG emissions and unsustainable land management.</p>	<p>its opaque supply chains that leave ample space for transgression, is beset with legal and policy risks. Regulation can impact business operations by limiting access to resources, increasing costs or introducing new standards. Legal risks associated with companies' impacts on nature. Market risks including changes in customer preferences, higher financing costs, if credit ratings decline with failure to implement risk mitigation, price increase or volatility of commodities or inputs, technological changes – such as new protein - that displace and disrupt markets.</p> <p>High or moderate risk to the protein and agriculture sectors from deforestation, include through impacts related to physical climate risks, water management, waste and pollution and natural capital, causing reputational, regulatory, credit and operational risks. Operational and value chain risk arises through dependencies on ecosystem services threatened by biodiversity loss. 60% of coffee varieties are in danger of extinction due to climate change, disease and deforestation, which could significantly destabilise global coffee markets – a sector with retail sales of \$83 billion in 2017.</p> <p>Drought causes water levels to drop, impacting cargo travel along the river, causing price increases, lost sales and halt in production.</p>
Manufacturing <sup>482</sup>	<p>Dependent on ecosystem services that supply the mining and forestry industries, for packaging and metals in products and create demand that drives the associated impacts, including</p>	<p>Groundwater stress (where demand exceeds supply, causing deterioration in quantity and quality) may lead to constrained or suspended production, requiring costly procurement of alternative supply or substitute resources.</p>

<sup>482</sup> Schneider Electric, [Assessing biodiversity footprint, the occasion to accelerate corporate biodiversity strategy](#) (2020); European Commission and CDC Biodiversité, [Schneider Electric's Biodiversity Footprint Assessment with the Global Biodiversity Score](#) (2019); European Commission and Arcadis Belgium, [Application of Biodiversity Net Gain Calculator \(BNGC\) on the site of Alvanca Aluminium in Duffel](#) (Belgium) (2019); Natural Capital Finance Alliance and PricewaterhouseCoopers, [Integrating Natural Capital In Risk Assessments: A step-by-step guide for banks](#) (2018) 25; United Nations Environment – Finance Initiative, [Are you ready for nature-related disclosure? An assessment of readiness and expectations from the corporate market](#) (2022) 42.

Sector	Dependencies and Impacts	Risks and Opportunities
	<p>land use change (see <a href="#">construction</a> and <a href="#">agriculture</a> case studies). Downstream GHG emissions to generate the electricity used and dissipated by products.</p> <p>Land-use impact of company facilities and physical footprint, including spread of invasive species. Impacts related to sea transport (see <a href="#">construction case study</a>). Dependent on groundwater, which is critical to production operations.</p>	<p>Nature-related risks associated with sourcing of raw materials such as wood and agricultural fibres. Degradation of ecosystem services would lead to supply chain disruption.</p>
Oil & gas <sup>483</sup>	<p>Dependent on flood and storm protection offered by habitats that act as storm surge and wind buffers and prevent or reduce flood intensity. The safe and efficient use of oil and gas depends on climate regulation, ground water, surface water, water quality, filtration, bioremediation and mass stabilisation and erosion control delivered through terrestrial and marine vegetation.</p> <p>Oil and gas operations drain substantial amounts of water, which can increase the risk of drought. Drilling seismic activity can result in mass flows which alter landscapes. Oil and gas products and use of high-pressure mechanisms lead to elevated risk of explosions that can cause widespread fires. They</p>	<p>Degraded habitats create risk of flood and storm damage to extensive, exposed infrastructure. Disruption can affect the whole value chain, in particular production and transportation, resulting in considerable financial losses due to cost of repairs and daily revenue loss for halted production.</p> <p>Similarly, loss of terrestrial vegetation can lead to avalanches and landslides and loss of mangroves, seagrass and macroalgae diminishes the protection from coastal erosion, risking damage to crucial infrastructure.</p> <p>Opportunities might include water stewardship and sustainable shipping initiatives, revegetation of habitats to protect infrastructure and create positive biodiversity outcomes, and using biodiversity impact assessments to identify habitat sensitivities and plan mitigation and avoidance activities during project planning and decommissioning. However, if this nature-based solutions are</p>

<sup>483</sup> Natural Capital Finance Alliance and PricewaterhouseCoopers, [Integrating Natural Capital In Risk Assessments: A step-by-step guide for banks](#) (2018) 23; Australian Conservation Foundation, [Nature-based economy: How Australian Prosperity depends on nature](#) (2022) 27 and 44; Considerations on impacts are based on ENCORE, [Exploring Natural Capital Opportunities, Risks and Exposure](#) (last accessed 1 December 2022); UNEP, [Turning the Tide: How to finance a sustainable ocean recovery](#) (2020) 73. ENCORE, [Mass stabilisation and erosion control](#) (last accessed 1 December 2022); Nature-based Insetting, [Nature-based insetting](#) (last accessed 7 December 2022); Ipieca and International Association of Oil & Gas Producers, [Biodiversity and ecosystem services fundamentals, Guidance document for the oil and gas industry](#) (2016), Ipieca, [Impact Opportunities, Nature](#) (last accessed 7 December 2022); Nature-based Solutions Initiative, NbSI talk: [Value & limits of working with nature to address climate change](#) (2021: last accessed 7 December 2022)

Sector	Dependencies and Impacts	Risks and Opportunities
	<p>have a high impact on terrestrial, freshwater and marine ecosystems. Loss of vegetation caused by oil and gas drilling and exploration disrupt local species through habitat fragmentation. Oil and gas activities lead to increased GHG emissions, pollutants, soil erosion, soil pollution, noise and light pollution that disturb species' migration routes and habitats.</p>	<p>implemented as offsetting or "insetting" activity (offsetting greenhouse gas emissions within the value chain) rather than to create biodiversity value in its own right, this remediates rather than prevents impacts, which distracts from and fails to address the need to decarbonise and phase out the fossil fuels that are the sector's key products.</p>
Pharmaceuticals <sup>484</sup>	<p>25% of drugs used in modern medicine are derived from rainforest plants, 50% of prescription drugs are based on a plant-derived molecule and 70% of cancer drugs are natural or inspired by nature. Some drugs (including for cancer, heart disease, diabetes) are based on a scientific analysis of venom or animal saliva. Malaria drugs quinine and coartem are dependent on the cinchona tree and <i>artemisia annua</i> plant.</p>	<p>Only 15% of global plant species have been evaluated to determine their pharmacological potential. The loss of a vast repository of undiscovered genetic materials (through deforestation and fires) means loss of potential new drugs and treatments (we are already losing an estimated one potential major drug every two years) threatening the growth of the pharmaceutical industry.</p>
Tourism <sup>485</sup>	<p>Tourism dependent on coral reefs (directly through diving and wildlife watching and indirectly through ocean views, beaches and seafood) is valued at \$36 billion globally. Tourism in Caribbean regions is dependent on suitable weather conditions, regulated by ecosystem services. Tourism depends on balanced ecosystems creating clear waters.</p>	<p>The loss of coral reefs as a result of global warming (estimated 99% loss at 2°C) poses risk to the tourism industry. Tourism is a key contributor to the economy of Caribbean regions. Increased storms and wind speeds may create risk (through damage and reduced demand) to hotels, cruise providers and tour operators. Risks posed by excessive blooms of sargassum seaweed fueled by fertilisers and sewage, deterring tourists. \$17m cost of clearance and hotel occupancy rates dropped.</p>

<sup>484</sup> World Economic Forum, [Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy](#) (January 2020) 18; World Economic Forum and PwC, [Bio-positive Strategies for Sustainable Business Growth](#) (2011) 11 (Information supplied to PwC by Novartis)

<sup>485</sup> World Economic Forum, [Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy](#) (January 2020) 15; NCF and PwC, [Integrating natural capital in risk assessments: A step-by-step guide for banks](#) (2018); The Guardian, [Seaweed invasion threatens tourism in Mexico's beaches as problem worsens](#) (2019)



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