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ACSI

Biodiversity

Unlocking natural capital value for Australian Investors

November 2021

About ACSI

Established in 2001, ACSI exists to provide a strong voice on financially material environmental, social and governance (ESG) issues.

Our members include 34 Australian and international asset owners and institutional investors with over $1trillion in funds under management.

Through research, engagement, advocacy and voting recommendations, ACSI supports members in exercising active ownership to strengthen investment outcomes. Active ownership allows institutional investors to enhance the long-term value of retirement savings entrusted to them to manage.

ACSI members can achieve financial outcomes for their beneficiaries through genuine and permanent improvements to the environment, social and governance (ESG) practices of the companies in which they invest.

34 Australian and international investors

Leading voice on ESG issues and advocacy

ACSI members manage $1 trillion in funds

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Disclaimer

Foreword

Biodiversity – the diversity of life in the natural world – is facing destruction at unprecedented rates globally. As long-term investors, ACSI's members have a strong interest both in managing the risks associated with biodiversity loss, and in encouraging companies to pursue opportunities associated with preserving biodiversity, all in the best financial interests of their beneficiaries.

Biodiversity loss is an emerging ESG issue, with Australian investors seeking to understand how to manage and address the financial risks to businesses they invest in.

ACSI has commissioned EY to produce this report to support understanding of these risks and provide recommendations about actions that investors can take in response.

This research is the first of its kind in the Australian market. It considers biodiversity from an investor perspective, explaining how biodiversity-related risks manifest and canvassing Australian and international responses to date.

With the recent conclusion of the first phase of the Fifteenth meeting of the Conference of the Parties to the Convention on Biological Diversity (COP15), the acceleration of global action on biodiversity loss is set to continue.

Measurement of biodiversity loss and its financial implications is still at an early stage, but evolving rapidly, and much can be done now to improve knowledge of the risks and opportunities. This report provides the foundation for Australian investors to understand the scale of the issue and the types of financial risks affecting companies across different sectors of the economy.

The creation of Taskforce for Nature Related Financial Disclosure (TNFD) (while still under development) signals a global shift in investor interest in understanding and managing these risks. This report is an important step in ensuring institutional investors consider biodiversity-loss related risks in their investments, and prepare for the development and implementation of the TNFD.

This report also proposes practical recommendations for investors to respond to these risks. The recommendations cover: planning and educating, corporate engagement, managing risk, shaping policy development, and monitoring targets.

ACSI will use this research to begin targeted conversations with companies about managing biodiversity loss-related risks and opportunities, to develop its own biodiversity and nature related plans and policies, and to support the Australian investor community's understanding of the increasing global focus on this issue.

Louise Davidson
Chief Executive Officer

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Executive summary

Biodiversity underpins human existence and has significant economic, social and cultural value. This value is being rapidly eroded by unprecedented rates of biodiversity loss, posing a material risk for investors within Australia and globally. More than 50 per cent of the world's total GDP is moderately or highly dependent on nature and the services it provides.[1] Yet, many investors and companies have a poor understanding of biodiversity as a core component of natural capital. It is estimated that by 2050, the Australian economy could lose up to USD20 billion annually as a result of nature loss.[2]

Biodiversity is the living component of natural capital. It supports ecosystem services that we depend on for basic needs such as clean air, water, food and fibre. We also value biodiversity in its own right for its cultural and recreational importance.

Biodiversity loss is accelerating, and this creates material risks and opportunities for investors based on companies' **dependencies** and **impacts** on biodiversity. The World Economic Forum's 2021 *Global Risk Report* lists biodiversity loss and ecosystem collapse as one of the top five risks for the next ten years.[3] Risks and opportunities are present at the asset, portfolio and economy-wide level. Some are already being realised, with many more emerging.

Industries with high dependencies on biodiversity through their operations:

Fisheries, forestry, agriculture and aquaculture; food, beverages and tobacco; heat utilities; construction.[4]

Industries with high impacts on biodiversity in their operations or value chains:

Food; infrastructure and mobility; energy; fashion. Together, these account for approximately 90% of global biodiversity loss.[5]

These impacts and dependencies manifest in risk in three ways:

1. Physical risks arise from biodiversity changes which reduce the availability or quality of the ecosystem services on which a company depends. Common physical risks include productivity loss, reduced availability of raw materials, and business and supply chain disruptions.
2. Transition risks arise from changes in the legal, societal and economic expectations of a company's impact on biodiversity. For example, companies in the mining sector may face reduced scope to develop greenfield sites due to tougher biodiversity-related regulation.
3. Systemic risks arise from economy-wide dependencies and impacts on biodiversity that affect critical natural systems or financial stability at the portfolio or system level. For example, the collapse of the Great Barrier Reef is a financially material systemic risk that would affect the Australian tourism industry.

[1] World Economic Forum, 2020, Half of World's GDP Moderately or Highly Dependent on Nature, Says New Report, https://www.weforum.org/press/2020/01/half-of-world-s-gdp-moderately-or-highly-dependent-on-nature-says-new-report/
[2] WWF, 2021, WWF: future nature loss a huge blow to Australia's economy. https://www.wwf.org.au/news/news/2020/wwf-future-nature-loss-a-huge-blow-to-australia-s-economy#gs.eryl8k
[3] World Economic Forum, 2021, The Global Risks Report 2021 (16th Edition), https://www3.weforum.org/docs/WEF_The_Global_Risks_Report_2021.pdf
[4] World Economic Forum, 2020, Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy, https://www3.weforum.org/docs/WEF_New_Nature_Economy_Report_2020.pdf
[5] Kurth, T., Wubbels, G., Portafaix, A., Meyer zum Felde, A. and Zielcke, S., 2021, The Biodiversity Crisis Is a Business Crisis, BCG, https://www.bcg.com/en-au/publications/2021/biodiversity-loss-business-implications-responses

Without investor, company and regulator action, these risks could result in significant adverse financial impacts.

Australian investors are exposed to both domestic and global biodiversity risks through the value chains of their portfolios. Australia's unique and valuable collection of biodiversity is in a fragile state, having been depleted more than that of any other developed nation in the past 200 years.[6] Some of this can be linked either directly or indirectly to the value chains of Australian companies, including in the agriculture, transport, infrastructure and property sectors.[7]

In recent years, there has been a surge in regulatory and investor action overseas, coupled with a proliferation of tools and frameworks to understand and manage the risks from biodiversity loss. In Australia, regulation has not yet responded to the decline in biodiversity, although changes to the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) have recently been recommended by the 2020 statutory review of the EPBC Act conducted by Professor Graeme Samuel AC (the Samuel Review). Furthermore, relatively few Australian investors have begun to act on the material biodiversity risks within their portfolio, and most instances of company disclosure on biodiversity are immature.

The investor response to climate change risks and opportunities holds several lessons for the treatment of biodiversity. The two risks are closely interlinked, and are similar in scale and urgency. Globally, there is widespread investor understanding of the significant external risks associated with climate change, and many investors have now moved to manage the risk in their portfolios. While this existing work will support investors to respond to biodiversity loss, there are also some important differences, for example, biodiversity currently lacks a universal metric for impact, unlike climate change (which uses CO_2-e).

The financial sector's response to biodiversity loss and the associated risks is still evolving, but a substantial number of analytical tools and disclosure frameworks have emerged to facilitate an effective investor response. The recently established Taskforce on Nature-related Financial Disclosures (TNFD) is gaining significant traction in the market and is expected to become a standard framework in the Australian financial sector.

[6] Waldron, A., Miller, D., Redding, D., Mooers, A., Kuhn, T., Nibbelink, N., Roberts, J., Tobias, J. and Gittleman, J., 2017. Reductions in global biodiversity loss predicted from conservation spending, Nature, 551(7680), pp.364-367.
[7] Bush Heritage Australia, Land Clearing & Its Impacts - Bush Heritage Australia, https://www.bushheritage.org.au/what-we-do/our-challenge/land-clearing#anchor

Five critical recommendations for investors

This report recommends five critical actions that investors can take now to begin to understand and manage their biodiversity risks and opportunities, and to prepare to integrate and report against the TNFD framework. These are summarised below and set out in detail in the Section titled 'Investor Action Plan':

Plan and educate

Develop a clear plan for managing biodiversity-related financial risks and opportunities, including setting targets. Build the capability and competence of your organisation, including by starting to align to the TNFD framework.

Corporate engagement

Begin targeted engagement with companies to understand the current state of biodiversity risk and opportunity management in your portfolio and across asset classes.

Manage portfolio risks and opportunities

Identify, assess and manage material financial risks and opportunities associated with biodiversity. Start by undertaking a portfolio-level assessment to identify risk and opportunity across asset classes and consider appropriate investment actions.

Shape policy and framework development

Understand, and consider actively supporting, the development of the TNFD and the Finance for Biodiversity Pledge. Consider supporting the implementation of the Samuel Review to improve the management of biodiversity domestically.

Monitor and disclose targets

Monitor company performance, and track and disclose own performance against targets relating to biodiversity.

Putting a price on biodiversity

Globally, ecosystem services have been valued at more than USD125 trillion annually. More than half of the world's GDP, around USD44 trillion, is moderately or highly dependent on nature. In a business-as-usual scenario, between 2011 and 2050, biodiversity loss could cost the global economy almost USD10 trillion, or USD479 billion annually.[8]

Biodiversity and nature loss

More than 50 per cent of the world's total GDP is moderately or highly dependent on nature and the services it provides.[9] Yet, many investors and companies have a poor understanding of biodiversity as a core component of natural capital. Biodiversity is in rapid decline globally, with a 60 per cent decline in the population of the world's mammals, birds, fish, reptiles and amphibians in just over 40 years.[10] This loss could have a catastrophic impact on both the economy and society.

Valuing biodiversity

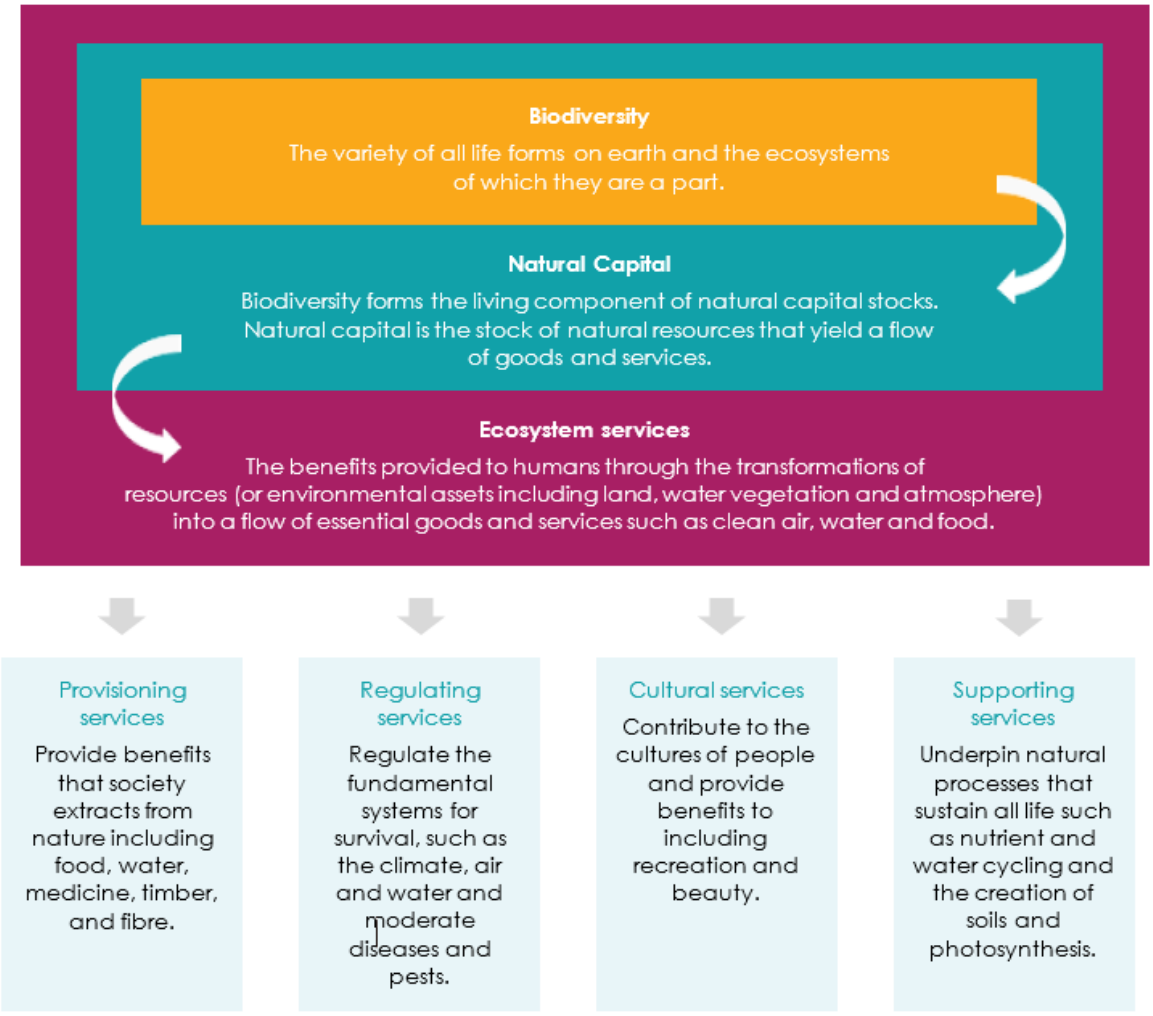
Biodiversity is the variety of all life forms on Earth - the different plants, animals, and micro-organisms, as well as the ecosystems they are part of.[11]

While the terms biodiversity and nature are sometimes used interchangeably, they have distinct meanings. Biodiversity forms the critical living component of 'natural capital', which is the stock of the Earth's renewable and non-renewable resources.[12]

Natural capital supports the flow of 'ecosystem services', which are the benefits derived from the ecosystem for both people and business.[13] Figure 1 shows the relationship between biodiversity, natural capital, and the four categories of ecosystem services.[14]

[8] Johnson, J., et al, 2020. Global Futures: Modelling the global economic impacts of environmental change to support policy-making, WWF, https://wwfint.awsassets.panda.org/downloads/global_futures_technical_report.pdf
[9] World Economic Forum, 2020, Half of World's GDP Moderately or Highly Dependent on Nature, Says New Report, https://www.weforum.org/press/2020/01/half-of-world-s-gdp-moderately-or-highly-dependent-on-nature-says-new-report/
[10] Grooten, M. and Almond, R., 2018, Living planet report 2018, WWF, https://www.worldwildlife.org/pages/living-planet-report-2018
[11] Biodiversity - Department of Agriculture, Water and the Environment. 2021. https://www.awe.gov.au/environment/biodiversity#:~:text=Conservation%20of%20Australia%27s%20biodiversity%20Biodiversity%20is%20the%20variety,the%20ecosystems%20of%20which%20they%20are%20a%20part
[12] Cambridge Conservation Initiative. n.d, Biodiversity and natural capital | Cambridge Conservation Initiative, https://www.cambridgeconservation.org/project/biodiversity-and-natural-capital/
[13] Morton, S., Sheppard, A. and Lonsdale, W., 2014. Biodiversity, CSIRO, https://www.publish.csiro.au/ebook/download/pdf/6967
[14] Some sources use alternative terms to capture these contributions. For example, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) uses the term 'nature's contribution to people' to refer to the contributions of living nature to the quality of life for people.

Figure 1: The relationship between biodiversity, natural capital, and four types of ecosystem services.[14]



[1414] World Resources Institute, 2005, Ecosystems and Human Well-being: Biodiversity Synthesis, https://www.millenniumassessment.org/documents/document.354.aspx.pdf

The significant value provided by biodiversity through ecosystem services remains widely unrecognised and undervalued, and in many cases, is excluded from market prices. This results in the underappreciation of its importance, and ultimately underinvestment in its protection. However, the recognition of the economic importance of biodiversity is beginning to shift. The World Economic Forum's 2021 *Global Risk Report* lists biodiversity loss and ecosystem collapse as one of the top five risks for the next ten years.[15] The seminal UK Dasgupta Review, published in February 2021, calls for a financial system that channels financial investments, both public and private, towards economic activities that enhance existing natural assets and encourage sustainable consumption and production activities.[16]

The natural environment is a significant contributor to the Australian economy and overall wealth of the nation. There have been several attempts to place an economic value on Australia's natural environment, however, these have used differing calculation and valuation methods, leading to inconsistent values. A report by the World Wildlife Fund found that under a business-as-usual scenario, the Australian economy could lose USD20 billion every year by 2050 because of nature loss, and identified Australia as the fifth worst-affected country based on potential GDP loss.[17]

Interaction between biodiversity and cultural values

For many Aboriginal and Torres Strait Islander peoples (First Peoples), cultural value and biodiversity value are inextricably linked, so it is imperative that cultural value is considered in parallel in decision making.

While many important and sacred sites for First Peoples are in places of rich biodiversity value, there is often a disconnect between the biodiversity that non-First Peoples Australians consider worthy of protection and First Peoples' cultural values.

Similarly, it is important that customary cultural values are respected where they interact with biodiversity values. For example, Australian fisheries that set biologically sustainable fishing limits consider specific allocations for First Peoples' cultural fishing practices.

Australia is one of 17 of the world's 'megadiverse' countries, making the sheer scale of Australia's biodiversity globally significant. Between seven and ten per cent of all species globally are found in Australia,[18] with many of these species only found in Australia.[19]

The natural environment is also an irreplaceable component of the culture of First Peoples. Over millennia, First Peoples have developed a close and unique connection with the lands and environments in which they live, and established distinct systems of knowledge, innovation and practices relating to the use and management of biodiversity.

Table 1: Valuing Australia's natural environment and associated services

AUD$6.4 trillion The value of Australia's natural capital in 2016-17 [20]	**AUD$56 billion** The estimated social and economic value of the Great Barrier Reef[21]	**AUD$24 billion** The value of agricultural production per year from the Murray-Darling Basin[22]

[15] World Economic Forum, 2021, The Global Risks Report 2021 (16th Edition), https://www3.weforum.org/docs/WEF_The_Global_Risks_Report_2021.pdf
[16] Dasgupta, P., 2021, The economics of biodiversity: the Dasgupta review, London: HM Treasury
[17] WWF, 2021, WWF: future nature loss a huge blow to Australia's economy, https://www.wwf.org.au/news/news/2020/wwf-future-nature-loss-a-huge-blow-to-australia-s-economy#gs.eryl8k
[18] Steffen, W. and Burbidge, A., 2009. Australia's biodiversity and climate change, Canberra: Dept. of Climate Change,
[19] Cresswell, I. and Murphy, H., 2017, Australia state of the Environment 2016: Biodiversity, https://soe.environment.gov.au/sites/default/files/soe2016-biodiversity-launch-version2-24feb17.pdf?v=1488792935
[20] Australian Bureau of Statistics, 2018, Australian Environmental-Economic Accounts 2018, https://www.abs.gov.au/ausstats/abs@.nsf/lookup/4655.0Media%20Release12018. *Note this figure includes the value of Australia's land, mineral, energy and timber resources.*
[21] Great Barrier Reef Foundation, n.d, The Value of the Reef, https://www.barrierreef.org/the-reef/the-value
[22] Australian Government - Department of Agriculture, Water and the Environment, n.d, Murray–Darling Basin, https://www.awe.gov.au/water/policy/mdb

Biodiversity's global and local decline

Biodiversity loss is primarily human-induced, altering 75 per cent of the Earth's land surface, impacting over 65 per cent of the ocean, and causing the loss of over 85 per cent of wetlands.[23] Human activity has also contributed to an average 60 per cent decline in the population size of mammals, birds, fish, reptiles and amphibians between 1970 and 2014.[24] Many scientists argue that the Earth's sixth 'mass extinction event' has now commenced. Mass extinction events are periods characterised by the loss of large numbers of species over geologically short time periods.[25] Unlike previous mass extinction events which have been driven by natural causes (such as collision with an asteroid), the sixth event is caused by human activity.

The 2019 Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services *Global Assessment Report on Biodiversity and Ecosystem Services* (the IPBES report) identified a widespread global failure to conserve nature and found that urgent transformative change is needed to restore and protect nature.[26]

Australia has also been slow to restore and effectively protect its natural capital (see the discussion in the Section titled 'The State of Play in Australia'). The state of Australian biodiversity is fragile and most recent State of the Environment report found that 'the outlook for Australian biodiversity is generally poor'.[27] Despite having a unique and valuable collection of biodiversity, Australia is estimated to have lost more biodiversity than any other developed nation in the past 200 years.[28]

UN Convention on Biological Diversity (CBD)

The CBD was agreed and established at the Earth Summit in 1992, and has three objectives: the conservation of biodiversity, the sustainable use of the components of biological diversity; and the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources.[335]

Phase one of the Fifteenth meeting of the Conference of Parties (COP15) in October 2021 culminated in the release of the Kunming Declaration. The Declaration calls for urgent and integrated action on biodiversity and sets out signatories' commitment to work towards a post-2020 global framework on biodiversity. The second phase of COP15 will be held from 25 April to 8 May 2022.

The major drivers of biodiversity loss within Australia include deforestation and land-clearing, climate change-induced drought and warming oceans, and invasive species. Some of these drivers can be linked either directly or indirectly to the value chains of Australian companies, including in the agriculture, transport, infrastructure and property sectors.[29] For example, over a five-year period to 2018, approximately 73 per cent of land clearing in Queensland was linked to the beef industry.[30]

The loss of ecosystem functions threatens local livelihoods, cultural value and broader economic production. The IPBES report characterises drivers of biodiversity loss as either indirect or direct:

- indirect drivers are the 'root causes of transformations, both pros and cons'.
- direct drivers are 'human actions to satisfy needs and goals'.[31]

Biodiversity loss leads to significantly reduced natural capital stocks and flows, which in turn reduces ecosystem services, on which many companies rely. The most significant direct and indirect drivers for global biodiversity loss are explored in Figure 2: Drivers of biodiversity loss.[32] [33]

[23] Diaz, S., Settele, J., Brondizio, E. and T.Ngo, H., 2021, The Global Assessment Report on Biodiversity and Ecosystem Services. Summary for Policy Makers, IPBES
[24] Grooten, M. and Almond, R., 2018, Living planet report 2018, WWF, https://www.worldwildlife.org/pages/living-planet-report-2018
[25] Ceballos, G., Ehrlich, P. and Raven, P., 2020, Vertebrates on the brink as indicators of biological annihilation and the sixth mass extinction, Proceedings of the National Academy of Sciences, 117(24), pp.13596-13602, https://www.pnas.org/content/117/24/13596
[26] Diaz, S., Settele, J., Brondizio, E. and T.Ngo, H., 2021, The Global Assessment Report on Biodiversity and Ecosystem Services. Summary for Policy Makers, IPBES
[27] Cresswell, I. and Murphy, H., 2017, Australia state of the Environment 2016: Biodiversity, https://soe.environment.gov.au/sites/default/files/soe2016-biodiversity-launch-version2-24feb17.pdf?v=1488792935
[28] Waldron, A., et al, 2017. Reductions in global biodiversity loss predicted from conservation spending. Nature, 551(7680), pp.364-367.
[29] Bush Heritage Australia, Land Clearing & Its Impacts - Bush Heritage Australia, https://www.bushheritage.org.au/what-we-do/our-challenge/land-clearing#anchor
[30] Cox, L., 2019. Beef industry linked to 94% of land clearing in Great Barrier Reef catchments, The Guardian, https://www.theguardian.com/australia-news/2019/aug/08/beef-industry-linked-to-94-of-land-clearing-in-great-barrier-reef-catchments
[31] Diaz, S., Settele, J., Brondizio, E. and T.Ngo, H., 2021, The Global Assessment Report on Biodiversity and Ecosystem Services. Summary for Policy Makers, IPBES
[32] Cresswell, I. and Murphy, H., 2017, Australia state of the Environment 2016: Biodiversity, https://soe.environment.gov.au/sites/default/files/soe2016-biodiversity-launch-version2-24feb17.pdf?v=1488792935
[33] Diaz, S., Settele, J., Brondizio, E. and T.Ngo, H., 2021, The Global Assessment Report on Biodiversity and Ecosystem Services. Summary for Policy Makers, IPBES

Figure 2: Drivers of biodiversity loss[34]

There is a critical gap in the availability and use of consistent and accurate data on biodiversity impacts at the asset level in Australia. This makes understanding drivers for biodiversity loss and their presence in portfolio a significant challenge for investors, especially for dependencies and impacts deeper within the value chain.

[34] Diaz, S., Settele, J., Brondizio, E. and T.Ngo, H., 2021, The Global Assessment Report on Biodiversity and Ecosystem Services. Summary for Policy Makers, IPBES

The 'twin crises': biodiversity loss and climate change

Biodiversity loss and climate change share many of the same indirect drivers (e.g. changing population, consumption, energy, trade, technology) and are negatively impacted by the prevalence of the other. While their connection is increasingly recognised, in practice they are largely addressed separately.[35] Table 2 outlines the connection between biodiversity loss and climate change.

Table 2: Connection between biodiversity loss and climate change

How does climate change impact biodiversity?	How does biodiversity loss impact climate change?
Direct: Climate change alters the physical environment, which impacts species' ability to survive in that environment (e.g. loss of biodiversity due to more frequent droughts, more intense bushfires, coral bleaching). **Indirect:** Climate change alters the interactions between species, influencing the presence and effect of competitors, predators and pathogens (e.g. expansion of invasive species into historically cooler climates).	Biodiversity loss results in increased atmospheric greenhouse gas concentrations through the loss of carbon stocks (e.g. via deforestation). Biodiversity loss reduces climate resilience (e.g. loss of urban forest contributes to urban heat island effect). While there is some debate about their role,[36] 'nature-based solutions' may be able to provide up to 37% of climate change mitigation required by 2030 to meet the goal of limiting global warming to less than 2˚C.[37] [38] [39]

While there are similarities in the drivers for, and impacts of, climate change and biodiversity loss, addressing these drivers require distinct solutions. Notable similarities and differences between climate change and biodiversity loss are shown in Table 3.

Table 3: Similarities and differences between climate change and biodiversity loss

Similarities	Differences
• Share many of the same indirect drivers (e.g. changing trade, population and technology) and direct drivers (e.g. land use change). • Require consideration at the local, regional and global levels to capture impacts and dependencies. • Risks can arise from the physical impacts as well as societal, technological and regulatory responses, and can manifest through the creation of stranded assets. • Biodiversity protection contributes to climate change adaptation and mitigation.	• Biodiversity currently lacks a universal metric for impact, unlike climate change (CO_2-e). Metrics for biodiversity loss, including mean species abundance, are further discussed in the section titled 'The global response'. • Biodiversity lacks a commonly accepted pricing approach, with no equivalent to a carbon price or social cost of carbon. Payment for ecosystem services does however provide a strong precedent for pricing a range of environmental externalities. • Biodiversity lacks widely used scenarios to undertake assessments of potential future states, which are a key component of climate risk and opportunity assessments. • Mechanisms for market valuation of assets with significant impact on GHG emissions (e.g. coal mines) are readily available, however, such mechanisms for identifying and valuing assets with significant biodiversity impacts are not. This is a result of the immaturity of a market for biodiversity, which is in turn driven by challenges relating to appropriate metrics.

[35] Pörtner, H.O., et al, 2021, IPBES-IPCC co-sponsored workshop report on biodiversity and climate change; IPBES and IPCC. DOI:10.5281/zenodo.4782538
[36] Seddon, N., et al, 2020, Understanding the value and limits of nature-based solutions to climate change and other global challenges. Philosophical Transactions of the Royal Society B: Biological Sciences, 375(1794), p.20190120m
[37] Griscom, B., et al, 2017. Natural climate solutions. Proceedings of the National Academy of Sciences, 114(44), pp.11645-11650.
[38] The International Union for Conservation of Nature defines nature-based solutions as 'actions to protect, sustainably manage and restore natural and modified ecosystems in ways that address societal challenges'.
[39] Nature-based carbon offsets should be used in conjunction with efforts to reduce emissions and should not be relied on as a panacea.

These similarities and the significant progress towards understanding and managing climate change risk in the last decade means that companies and investors alike will be able to leverage their existing approach towards climate change to kick-start action to address biodiversity loss. Some of the structures and practices that investors have adopted to consider climate-related risks and opportunities, such as the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD), will be transferable to manage risks associated with biodiversity loss.

For example, in considering climate change risks, many companies have already completed the difficult task of building emergent risks into their existing governance, strategy and risk management practices as well as setting related metrics and targets. However, in applying lessons from the TCFD, investors should ensure that the approach to biodiversity goes beyond disclosure to include *integrating* biodiversity risks and opportunities into strategic decision-making.

Taskforce on Nature-related Financial Disclosures (TNFD)

The TCFD has been a catalyst for greater corporate focus on the risks and opportunities from climate change and has been well adopted globally. The TNFD, currently under development, aims to leverage the TCFD's approach and to adapt this for nature-related risks and opportunities. This eliminates the need for entirely new structures and terminology to be developed and adopted. Like the existing TCFD, the TNFD will focus on the financial materiality of risks and opportunities.

Frameworks and tools for assessing and disclosing biodiversity impacts and dependencies are detailed in the section 'The global response' below.

The differences between climate change and biodiversity are also notable, as set out above. Unlike climate change, there may never be a universal metric for biodiversity. Given the multidimensional nature of biodiversity, it is more suitable to work towards developing a standardised and agreed set of indicators, metrics and indices (rather than a single, universal metric). While the development of these indicators, metrics and indices will support investor understanding, these will take time to develop, and investors should not wait for these to be developed before acting.

Nature related commitments at COP26

The 26th session of the Conference of the Parties (COP 26) to the United Nations Framework Convention on Climate Change was held from 31 October – 12 November 2021 in Glasgow. The event saw countries make several important commitments related to biodiversity and nature, including:

- **A commitment on forest and land use:** Leaders from more than 100 countries have signed the Glasgow Leaders' Declaration on Forest and Land Use which aims to halt and reverse deforestation and land degradation by 2030. While there is some scepticism about whether it will be sufficient to halt deforestation, it remains an important landmark commitment.
- **Australian Government active on natural capital:** Australia joined the TNFD forum with the UK, France and Switzerland with the view to helping to unlock natural capital investment from private finance and the banking sector. The Government has announced they will invest AUD 650,000 through the forum to promote engagement. The Government has also announced a Blue Carbon Accelerator Fund that will focus on blue carbon restoration and conservation projects.

Financial impacts of biodiversity change

A company's dependence and impact on biodiversity creates both risks and opportunities. These risks and opportunities manifest as financial impacts that investors need to understand and carefully manage to support the delivery of sustainable returns. As such, investors should engage with companies to understand and encourage active management and disclosure of biodiversity-related financial risks and opportunities.

What are biodiversity-related financial risks and opportunities for investors?

Institutional investors have a responsibility to enhance the long-term value of the savings entrusted to them, including through the consideration of financially material environmental, social and governance (ESG) risks and opportunities in their investment decision-making processes.

As shown in Figure 3, biodiversity could present a material financial impact for many companies stemming from:

- a company's contribution to biodiversity change (impacts).
- a company's dependency on biodiversity-related benefits (dependencies).[41]

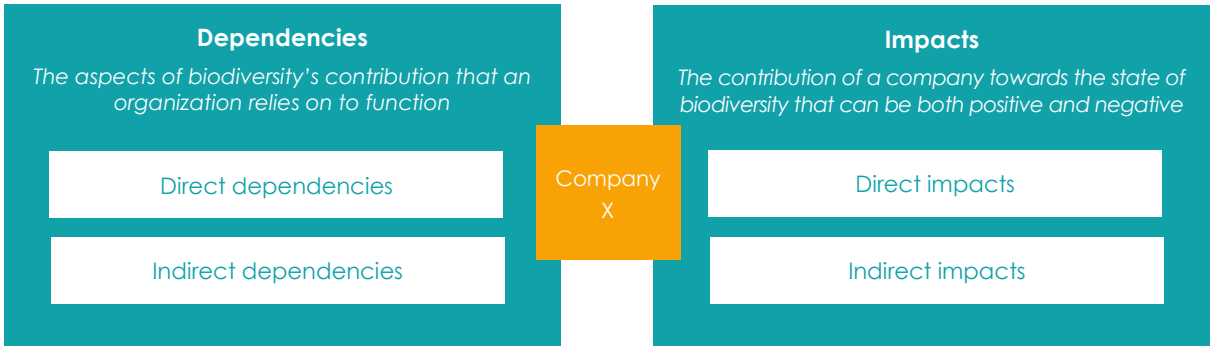
Industries with high dependencies on nature through their direct operations:

Forestry, agriculture, fishery, and aquaculture; food, beverages and tobacco; heat utilities; construction.[42]

Industries with high impacts on biodiversity in their value chains account for approximately 90 per cent of global biodiversity loss

Food; infrastructure and mobility; energy; fashion.[43]

Figure 3: Biodiversity impacts and dependencies[40]



[40] Science Based Targets Network, 2020, Science-based Targets for Nature: Initial Guidance for Business, https://sciencebasedtargetsnetwork.org/wp-content/uploads/2020/09/SBTN-initial-guidance-for-business.pdf
[41] Science Based Targets Network, 2020, Science-based Targets for Nature: Initial Guidance for Business, https://sciencebasedtargetsnetwork.org/wp-content/uploads/2020/09/SBTN-initial-guidance-for-business.pdf
[42] World Economic Forum, 2020, Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy, https://www3.weforum.org/docs/WEF_New_Nature_Economy_Report_2020.pdf
[43] Kurth, T., Wubbels, G., Portafaix, A., Meyer zum Felde, A. and Zielcke, S., 2021, The Biodiversity Crisis Is a Business Crisis, https://www.bcg.com/en-au/publications/2021/biodiversity-loss-business-implications-responses

For example, material risks can arise from biodiversity loss interrupting the supply of a good (e.g. timber) upon which a company is dependent, resulting in disruption to its operations (e.g. construction). Similarly, material risks can arise from a company's impact on biodiversity which results in regulatory intervention (e.g. to prevent deforestation) which disrupts planned operations (e.g. infrastructure development).

The identification of a company's or sector's material biodiversity risks and opportunities requires consideration of its operations **(direct)** as well as its upstream and downstream **(indirect)** activities, both locally and internationally. These direct and indirect impacts may be acute or chronic:

- **Acute** biodiversity impacts are event or project driven, for example where a mining company clears a specific section of vegetation to make way for a new mine, or where a farmer applies pesticides to a crop and inadvertently degrades soil biodiversity.[44]
- **Chronic** biodiversity impacts are longer terms shifts in the way that ecosystems function or cease to function.[45]

This is further compounded as these impacts can also be **cumulative,** where biodiversity is impacted from multiple events or projects over time, alongside background stressors such as climate change. Often, cumulative impacts cannot be attributed to a single company and may go undetected until substantial damage has been done. The Samuel Review (the review of the EPBC Act) highlights that Australia's current regulatory approach does not effectively address cumulative impacts.[46] Additional information on the recommendations of the Samuel Review is set out in *'The state of play in Australia'* on page 29. A discussion of the state of current tools for measuring cumulative impact is set out in *'The global response'* on page 22.

Types of biodiversity-related risk and opportunity: physical, transition and systemic

A company's dependencies and impact on biodiversity can pose a range of operational, legal, regulatory, and reputational challenges. More broadly, systemic changes to biodiversity have impacts on natural capital flows, affect ecosystem services and present system-wide risks, which can have material financial impacts for companies and their investors. While there is broad agreement on the underlying biodiversity risks and opportunities, there are different approaches to classifying them. Given the recent focus on the TNFD and its relevance to investors, the proposed TNFD classification has been adapted in Figure 4 for the purposes of classifying biodiversity risks and opportunities.[47]

[44] Gunstone, T., Cornelisse, T., Klein, K., Dubey, A. and Donley, N., 2021. Pesticides and Soil Invertebrates: A Hazard Assessment. Frontiers in Environmental Science, 9, Available at: https://www.frontiersin.org/articles/10.3389/fenvs.2021.643847/full
[45] TNFD, 2021, Nature in Scope: A summary of the proposed scope, governance, work plan, communication and resourcing plan of the TNFD, https://tnfd.global/wp-content/uploads/2021/07/TNFD-Nature-in-Scope-2.pdf
[46] Samuel, G., 2020, Independent Review of the EPBC Act – Final Report, Canberra: Department of Agriculture, Water and the Environment, https://epbcactreview.environment.gov.au/resources/final-report
[47] TNFD, 2021, Nature in Scope: A summary of the proposed scope, governance, work plan, communication and resourcing plan of the TNFD, https://tnfd.global/wp-content/uploads/2021/07/TNFD-Nature-in-Scope-2.pdf

Figure 4: Biodiversity risks and opportunities

How do these risks play out in the Australian economy?

Biodiversity dependencies and impacts throughout the economy mean that all sectors face biodiversity risks and opportunities with varying levels of exposure:[48]

- Forestry, agriculture, fisheries, food and beverage and construction are heavily dependent on biodiversity and are highly exposed to physical risks associated with biodiversity loss.
- While transition risk may affect all sectors, those with the greatest adverse impact on biodiversity are at greatest risk (e.g. mining, oil and gas, agriculture and the property sector).
- Investors should also be cognisant of the potential for ecosystem-wide collapse and its potential to impact entire regions and sectors.

The biodiversity risks and opportunities faced by each sector of the Australian economy is shown in Table 4.

Table 4: Biodiversity risks and dependencies by sector *#

Biodiversity risks and opportunities[49]		Consumer staples	Energy	Healthcare	Industrials	Materials	Real estate	Financials	Utilities	Consumer discretionary	Communication services	Information technology
Physical	1. Productivity	*		*	*		*			*		
	2. Availability and cost of raw materials	*	*	*	*	*	*		*	*		
	3. Business and supply chain continuity	*	*	*	*	*	*		*	*	*	*
Transition	1. Liability and litigation	*	*	*	*	*		*	*			
	2. Regulation and compliance	*	*			*	*	*	*			
	3. Market (including financing risk)	*	*	*	*	*	*	*	*	*		
	4. Technology and innovation	*	*	*	*	*	*		*			
	5. Reputation and social licence	*	*	*	*	*	*	*	*	*	*	*

Key: * Dependencies on biodiversity * Impacts on biodiversity * Economy wide dependencies on or impacts to biodiversity

* Adapted from the World Economic Forum's reports: Biodiversity and Business Risk, January 2010; Nature Risk Rising, January 2020.

All companies face systemic biodiversity-related risks from ecosystem wide impacts to critical natural systems and system-wide financial stability. Companies in the financial services sector also face systemic risks stemming from portfolio wide financial stability.

[48] PricewaterhouseCoopers, 2010, Biodiversity and business risk: A Global Risks Network briefing, https://www.pwc.co.uk/assets/pdf/wef-biodiversity-and-business-risk.pdf

[49] Adapted from: PricewaterhouseCoopers, 2010, Biodiversity and business risk: A Global Risks Network briefing, https://www.pwc.co.uk/assets/pdf/wef-biodiversity-and-business-risk.pdf

Table 5 provides examples of some of the physical and transition risks faced by several higher-risk sectors.

Table 5: Examples of physical and transition risks faced by higher-risk sectors

Sector	Sub-sector	Examples of risks in selected sectors
Consumer staples	Agriculture	• **Physical risk:** Lack of biodiverse native plantings leading to a lack of native pollinators (e.g. native bees) in turn lowering crop and horticulture yields which can lead to cash flow challenges and credit risk impacts • **Physical risk:** Decreased soil biodiversity reduces the productivity of the wheat crop for multiple seasons in a row leading to reduced cashflow and increased credit risk • **Physical opportunity:** Increased soil biodiversity increases productivity of wheat crop for multiple seasons in a row leading to improved cashflow and lower credit risk • **Transition risk:** Irrigated agriculture in a particular area reduces biodiversity in a local river basin. As a result, regulation is brought in which reduces water allocations, and prevents farming several crops with greatest financial return resulting in financial losses • **Transition opportunity:** Lower levels of biodiversity loss from agricultural activities compared to competitor results in an increase of relative market share due to changing consumer preferences • **Transition opportunity:** The introduction of new technologies in agriculture can increase yield and improve the biodiversity impacts per land area used for agriculture
	Fisheries	• **Systemic risk:** Unsustainable levels of fishing by multiple operators over a prolonged period of time results in loss of keystone species leading to collapse of primary commercial stock, leading to financial impact
	Retailing	• **Physical risk:** Loss of pollinator biodiversity reduces yield of raw food materials, in turn limiting the availability and increasing the cost of food products creating cost pressures within a competitive market • **Transition risk:** Controversies arising from the biodiversity impacts of a product sold by a supermarket (e.g. land clearing for agriculture resulting in the loss of key ecosystem service, resulting in the extinction of a threatened species) negatively affects its reputation with customers impacting sales
Materials	Metals & mining	• **Transition risk:** Biodiversity loss resulting from mining operations leads to a lawsuit (whether from governments, NGOs, or private individuals) for the environmental damage caused, which may result in compensatory and punitive damages • **Transition risk:** Changing regulations in relation to limiting biodiversity impacts affects the ability of mining operations to commence or expand planned projects • **Transition opportunity:** Positive biodiversity impacts of proposed mining operations increases the social licence to operate, improving community support for development
	Forestry	• **Physical risk:** Supply chain risks linked to sourcing timber from less regulated markets leads to increased volatility in price and availability of raw materials. • **Transition risk:** Biodiversity impacts (and inter-related climate impacts) associated with deforestation results in regulatory limits on forestry activities in certain ecosystems. Other transition risks may include changing consumer preferences away from products related to deforestation
Real estate	Real estate development	• **Physical risk:** Biodiversity loss due to unsustainable clearing throughout global supply chains reduces the availability and increases the cost of timber, reducing profitability and resulting in construction delays • **Transition risk:** Biodiversity impacts from developments results in delays to or rejection of project approvals due to changing regulatory requirements (which may arise from changing regulatory positions at local, state, national or international levels) • **Transition risk:** Biodiversity impacts from developments results in reputational damage due to disruption of key ecosystem or corridor

When are these risks financially material?

The risks and opportunities associated with biodiversity loss may result in material financial impacts for both companies and their investors. The nature of the financial impact will depend on a variety of factors including the industry, market and competitive environment, regulatory environment, individual strategic and risk management decisions. Some of the financial impacts that can materialise from biodiversity risks and opportunities are outlined in Figure 5.

The materiality of physical and transition risks stemming from biodiversity loss is expected to increase over time.[50]

Many of the economic benefits associated with biodiversity are not currently financially valued, in large part because there is not currently a consensus on an approach to valuing biodiversity, however significant effort is being put into this globally.

The nature of risks and opportunities in the financial services sector

While not included in the table above, the financial services sector is also exposed to significant biodiversity-related risks and opportunities. Unlike the sectors above, the financial services sector is predominantly exposed to risks through its business relationships with other entities (including companies in high-risk sectors) rather than because of its own activities. As an example, financiers and lenders could be exposed to financial conduct risks through their being linked to criminal activities such as illegal deforestation or wildlife trade. For this reason, financial services companies should actively assess their business relationships to identify and manage the way in which they may inherit biodiversity risk when entering into new business relationships. In some circumstances, financial services companies may also face regulatory and reputational risks as a result of their own activities, such as failing to comply with emerging regulations and societal expectations relating to biodiversity risk.

Over time, there is expected to be an increased focus on valuing ecosystem services, and biodiversity more broadly. While useful, investors should not wait for the development of an agreed approach on valuation to begin assessing their exposure to biodiversity-related risks and opportunities.

Figure 5: Examples of financial impacts arising from biodiversity

Examples of financial impacts arising from biodiversity

Credit rating
An agricultural company may have reduced crop yields due to low soil biodiversity caused by overuse of harmful pesticides. Reduced crop yields translate to lower revenue and a reduced ability to repay debts which would result in a lower credit rating.

Liquidity
A mining company is unable to commence planned operations due to changes to regulations that aim to limit biodiversity impact. This may cause the operations to become a stranded asset, with any initial investments lost or having very low rates of return.

Investment and capital
A real estate business that has significant negative biodiversity impacts because of land clearing and habitat destruction may not be able to attain environmental approvals required to secure future investment or capital to fund new projects.

Insurance
A decrease in the number of predatory animals results in increased frequency and severity of locust swarms. As a result, an agricultural company may not be able to obtain insurance to cover the loss of its crop, or may have to pay significantly higher premiums.

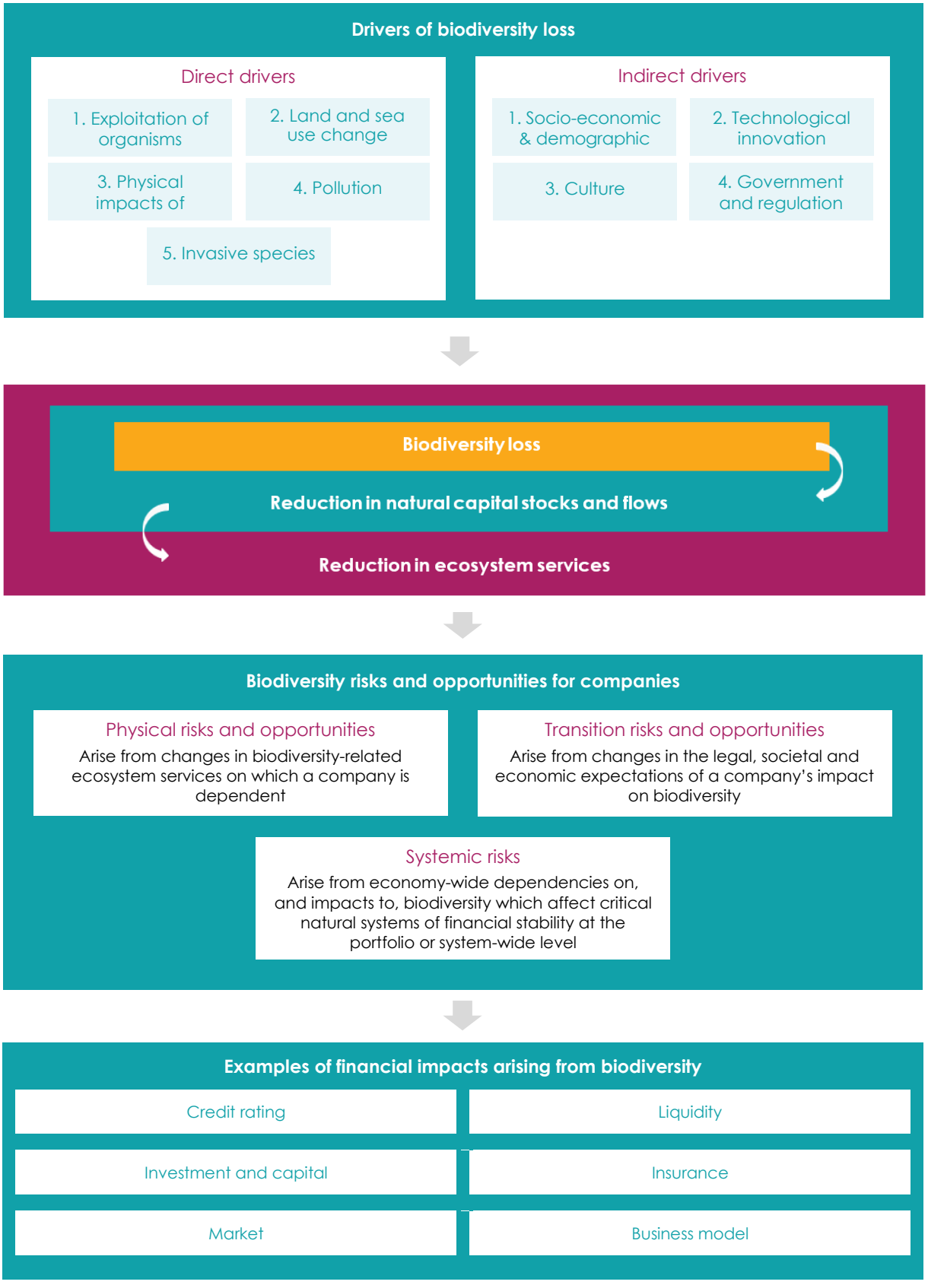
Market
A clothing company may lose its social licence to operate because it is linked to cotton plantations with significant adverse biodiversity impacts. As a result, the company may see lower revenues and a reduction in overall profitability.

Business model
Loss of plant and animal biodiversity may limit an entrepreneurial pharmaceutical company's ability to identify new medicines, thereby impacting the business' overall profitability and the long-term viability of its business model.

[50] Smale, R. and Zadek, S., 2020, Towards a Common Framework...at the Nexus of Financing and Biodiversity, https://www.vivideconomics.com/wp-content/uploads/2020/04/Finance-for-Biodiversity-Common-Framework-April-2020.pdf

In summary: biodiversity loss as an investment risk

Figure 6: Biodiversity and investment risk – key drivers, risks and opportunities for companies



Opportunities for sustainable finance

While there are a range of risks associated with biodiversity loss, addressing biodiversity loss presents a broad range of opportunities. For example, there are a number of sustainable finance instruments that have the potential to achieve positive financial and biodiversity outcomes, as are outlined in Table 6.

Table 6: Examples of sustainable finance initiatives that can support biodiversity

Blue/green sovereign debt Debt securities issued by governments to finance projects with positive environmental outcomes	**Impact investing** Investments which deliver financial returns in addition to positive environmental and social impacts (e.g. natural capital funds, land restoration funds)	**Pureplay lending** Financial institutions that focus solely on providing loans to biodiversity positive companies
Sustainability linked loans Loans provided to organisations for general purposes with pricing benefits for meeting defined sustainability targets (e.g. target of net positive biodiversity impact)	**Green bonds** Deliver long-term financial returns with proceeds used to fund projects with positive environmental impacts. Green bonds range from impact to investment grade.	

Opportunities for cultural and biodiversity co-benefits

Over the past decade, there has been increased recognition of the value of incorporating First Peoples' knowledge, innovations and practices into environmental management to deliver positive outcomes for the Australian environment. First Peoples play a significant role in direct land and sea protection and management throughout Australia. Collaborating with First Peoples in restoration and land management projects can lead to culturally appropriate restoration of Country, provision of products and services that benefit both First Peoples and all Australians, and the creation of commercially viable initiatives.

Some examples of these opportunities include:

- Culturally sensitive land restoration to provide bush tucker and medicinal plants for traditional owners.
- Working with First Peoples on emissions reduction projects such as Savanna fire management projects.
- Restoration projects that include planting of commercially valuable species such as sandalwood and boronia and/or provide for production of honey to generate income for First Peoples communities.

10 Deserts Project

The 10 Deserts Project, led by the Indigenous Desert Alliance, is an example of a mutual benefits project that is delivering positive biodiversity, nature, cultural and commercial outcomes. The project integrates contemporary natural resource management best practice with traditional cultural and ecological knowledge and establish systems and approaches, including long-term financing and market enabling strategies that will build environmental resilience across the desert landscape. The project is Indigenous led and supported by international and regional conservation partners and funding from the BHP Foundation.

For example, the NSW Department of Planning, Industry and Environment (DPIE) has committed to working with First Peoples communities in Western Sydney as part of the Cumberland Plain Conservation Plan. DPIE plans to work with Western Sydney's First Peoples to co-develop a '10-year Aboriginal Implementation and Engagement Strategy'. The strategy aims to incorporate cultural values and knowledge of First Peoples in conservation outcomes and to ensure First Peoples in the area benefit from the delivery of the conservation plan.[51]

Investors and companies considering opportunities to collaborate with Traditional Owners or conducting projects on Country should consider whether:

1. There is sufficient evidence to support an understanding of the biodiversity and cultural value that is being impacted and to support an assessment of how it is being impacted.
2. Whether Traditional Owners have been engaged in a process to obtain free, prior and informed consent (FPIC).[52]

FPIC involves building trust with community, which can require significant time investment. In some instances, this will require providing additional support for Traditional Owners to ensure that consent is truly informed. These costs should be borne by the company and factored into project development planning.

Opportunities for climate and biodiversity co-benefits

As outlined in the section titled 'Biodiversity and nature loss', investors will be able to leverage some elements of their approach to managing climate risks and opportunities to manage risks and opportunities linked to biodiversity. Aligning these approaches will help to identify initiatives that support concurrent action on these 'twin crises' and which should be prioritised by investors such as:

- Avoided/reversed ecosystem degradation: Many ecosystems act as major carbon sinks, so maintaining the biodiversity of these ecosystems ensures these sinks can continue to operate effectively.
- Ecosystem restoration: Ecosystem restoration can be cost-effective, enhance resilience of biodiversity to climate change and increase the provision of ecosystem services.
- Sustainable agriculture, fisheries and forestry: Maintaining ecosystems can improve adaptive capacity, enhance biodiversity, increase carbon storage in farmland, forest soils and vegetation and reduce atmospheric GHG concentrations.
- Green infrastructure: Urban greening reduces the urban heat island effect, enhances urban biodiversity, improves quality of life and can effectively sequester and store carbon.[53]

Conversely, some climate mitigation and adaptation strategies can have negative biodiversity impacts which will need to be managed. These include change of land use for renewables, increased area used for bioenergy cropping, afforestation in areas historically not forested, and the extraction and use of rare minerals in renewable energy technology.[54]

[51] NSW Department of Planning, Industry and Environment, 2021, Partnering with Western Sydney's Aboriginal community, https://www.planning.nsw.gov.au/CPCPgrant
[52] For example, see the UN Food and Agriculture Organization's 'Free, Prior and Informed Consent Manual'. Available at: https://www.un.org/development/desa/indigenouspeoples/publications/2016/10/free-prior-and-informed-consent-an-indigenous-peoples-right-and-a-good-practice-for-local-communities-fao/
[53] Pörtner, H.O., et al, 2021, IPBES-IPCC co-sponsored workshop report on biodiversity and climate change; IPBES and IPCC. DOI:10.5281/zenodo.4782538
[54] Pörtner, H.O., et al, 2021, IPBES-IPCC co-sponsored workshop report on biodiversity and climate change; IPBES and IPCC. DOI:10.5281/zenodo.4782538

The global response

In recent years, several factors including the Fifteenth meeting of the Conference of the Parties to the Convention on Biological Diversity (COP15), increasing investor focus on ESG risk, and a proliferation of tools and frameworks have come together to enable more widespread investor understanding of biodiversity loss. However, while investor interest in ESG risks has been accelerating, funding for natural capital has not kept pace.

Global regulatory movements

Globally, there is increasing regulatory action in relation to biodiversity loss. Countries are introducing a variety of new approaches, including the implementation of strict laws on the commercial use of specific land areas, subsidy reforms, taxes and fines, implementation of science-based targets, and trade directives. Some current developments are outlined in Table 7.

Table 7: Examples of international regulatory initiatives

Global	In 2010, the UN Convention on Biological Diversity (CBD) held in Aichi, Japan, established a Strategic Plan for Biodiversity 2011 to 2020. At a global level, none of the 20 'Aichi targets' have been fully achieved, with six targets partially achieved, and 14 not achieved.[55] The UN's Sustainable Development Goal 15 is to 'protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity.
Europe	EU regulation 2020/852 introduced an EU-wide taxonomy of environmentally sustainable economic activities and includes an objective relating to the protection and restoration of biodiversity and ecosystems. The regulation imposes disclosure requirements on financial institutions in relation to their alignment with six environmental objectives including biodiversity.[56] The EU has also approved a proposal for the EU Directive on Mandatory Human Rights, Environmental and Good Governance Due Diligence, expected to be approved in 2022.[57]
France	Article 29 of France's Energy-Climate Law requires all financial institutions to disclose their climate and biodiversity-related risks (considering both impacts and dependencies), strategy for reducing biodiversity impacts, specific biodiversity targets and level of alignment with international biodiversity goals.[58]
United States	A number of high-profile bills have been introduced into United States Congress recently, including the Fostering Overseas Rule of Law and Environmentally Sound Trade (FOREST) Act, which would prohibit the import of commodities sourced from illegally deforested land,[59] and the Safeguarding America's Future and Environment (SAFE) Act, which would establish a national approach to protect fish, wildlife and plants from the effects of climate change.[60]
United Kingdom	The UK Environment Bill, which is currently before the House of Lords, aims to address biodiversity loss and climate change on a domestic and global level by setting targets, plans and policies for improving the natural environment and increasing environmental protection.[61] This follows the release of the Dasgupta Review, commissioned by the UK to review the global economics of biodiversity.[62]
Costa Rica	The Payments for Environmental Services program was introduced to preserve and improve Costa Rican forest. The program banned the conversion of established forests and introduced payments to landowners for the ecosystem services that their land produced.[63] [64]
Indonesia	Indonesia introduced a moratorium on permits for the conversion of primary natural forests and peatlands for palm oil, pulpwood and logging concessions to limit forest fires and deforestation.[65]

See Section titled 'The state of play in Australia' for an overview of relevant regulation in Australia.

[55] Secretariat of the Convention on Biological Diversity, 2020, Global Biodiversity Outlook 5, https://www.cbd.int/gbo/gbo5/publication/gbo-5-en.pdf
[56] Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088, Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32020R0852
[57] European Parliament, 2021, Corporate due diligence and corporate accountability, https://www.europarl.europa.eu/doceo/document/TA-9-2021-0073_EN.html
[58] Green Finance Platform, 2021, France's Law on Energy and Climate Adds Coverage of Biodiversity, Ecosystems, and Renewable Energy to Investors' Non-Financial Reporting, https://www.greenfinanceplatform.org/policies-and-regulations/frances-law-energy-and-climate-adds-coverage-biodiversity-ecosystems-and
[59] The Fostering Overseas Rule of Law and Environmentally Sound Trade (FOREST) Act of 2021, https://www.schatz.senate.gov/imo/media/doc/forest_act_summary.pdf
[60] United States of America Government, Safeguarding America's Future and Environment Act
[61] UK Parliament, Environment Bill, Available at: https://bills.parliament.uk/publications/42717/documents/683
[62] Dasgupta, P., 2021, The economics of biodiversity: the Dasgupta review, London: HM Treasury
[63] Centre For Public Impact (CPI). 2021, Reforesting Costa Rica through Payments for Environmental Services (PES), https://www.centreforpublicimpact.org/case-study/payments-for-environmental-services
[64] United Nation: Climate Change. 2021, Payments for Environmental Services Program | Costa Rica, https://unfccc.int/climate-action/momentum-for-change/financing-for-climate-friendly-investment/payments-for-environmental-services-program
[65] Taylor, M., 2021, Analysis -To hit climate goals, Indonesia urged to ban new palm oil plantations forever, https://www.reuters.com/article/indonesia-palmoil-climate-idUSL4N2OZ0EG

An eruption of tools and frameworks

Many tools and frameworks have been developed, or are being developed, with the aim of supporting investors and companies to understand, capture, and appropriately address and disclose on their biodiversity impacts and dependencies. These tools and frameworks complement existing standards and regulations which address various aspects of the broader biodiversity landscape.

Rapidly evolving tools for assessing biodiversity impacts and dependencies

There are a number of tools available internationally for businesses and investors to develop an understanding of their biodiversity impacts and dependencies. The methodologies and outputs of these tools vary significantly and are evolving rapidly as the availability of data and business understanding improves.[66] [67]

Is there an agreed metric for biodiversity loss?

The understanding and management of climate impacts has been greatly aided by convergence on a universal metric of CO2-e, supported by the widely agreed methodology in the Greenhouse Gas Protocol. By comparison, the measurement of biodiversity impacts and dependencies is considerably less mature and more complex:

- Multiple dimensions to biodiversity loss: Multiple metrics are required to measure different biodiversity impacts, such as the loss of abundance of all species, the risk of extinction of the species, the endemicity of the biodiversity impacted, the value of the ecosystem services lost and the loss of habitat connectivity.
- Measuring impacts and dependencies: Metrics are required to measure both the biodiversity impact and dependency. In relation to climate change, only the impact is relevant.

Metrics are required to monitor biodiversity impacts and dependencies over time, assist in the assessment of biodiversity risks and opportunities and to guide decision-making.

While there is no agreed, single metric for measuring biodiversity loss, several metrics have emerged to quantify the magnitude of a company's biodiversity impact and dependency across the value chain, a selection of which are set out in Table 8. A discussion of factors to be considered in utilising these metrics is set out in the 'Investor action plan'.

Adopting the Greenhouse Gas Protocol to biodiversity impacts and dependencies

Some tools have adopted the approach used by the Greenhouse Gas Protocol to categorise biodiversity impacts and dependencies across the value chain.[67]

Scope 1 impacts and dependencies arise from direct activities and operations.

Scope 2 impacts and dependencies arise from the impacts and dependencies of the suppliers of purchased energy.

Scope 3 impacts and dependencies arise from all other upstream activities (e.g. from purchased goods and services) and downstream activities (e.g. processing and use of sold products).

However, using this approach may obscure some of the complexities of biodiversity loss, particularly when it is caused by indirect impacts. Debate is ongoing on the best approach to categorise biodiversity loss across a business' operations and supply chain.

[66] Lammerant, J., et al, 2021, Assessment of Biodiversity Measurement Approaches for Business and Financial Institutions, EU Business @ Biodiversity Platform, https://ec.europa.eu/environment/biodiversity/business/assets/pdf/EU%20B@B%20Platform%20Update%20Report%203_FINAL_1March2021.pdf
[67] Business @ Biodiversity, 2019, Technical Workshop on Biodiversity Accounting Approaches for Business (Minutes), https://ec.europa.eu/environment/biodiversity/business/assets/pdf/2019/Workshop_26.27_March_Minutes_FINAL.pdf

Table 8: Available metrics for measuring biodiversity impacts and dependencies

Metrics currently used by investors to measure impact on biodiversity[68]		
MSA	Mean Species Abundance	Measure the level of 'intactness' of species in a given area (measuring each species equally, without consideration of whether the species is under threat)
PDF	Potentially Disappeared Fraction	
STAR	Species Threat Abatement and Restoration	Measures the risk of species extinction (weighted by species threat status)
Metrics currently used by investors to measure dependency on biodiversity[69]		
-	Dependency score (%)	Measures the level of dependency on ecosystem services of a company, sector or fund (0-100%)

The use of CO2-e as the universal metric for climate change mitigation took some time to develop, and it is expected that it will be some time before a commonly accepted biodiversity metric, or several metrics, emerge. The development of a universally agreed metric will require:

- investor support for and input into the selection of the metric
- demonstrated 'useability' of the metric for assessing biodiversity-related risks and opportunities.

Despite the widespread use of CO2-e, the metric is subject to ongoing revision to reflect more accurately the impact on the climate. This is because the process of arriving at this universal metric of CO2-e requires significant simplification, and use of assumptions and approximations. Any agreed biodiversity metrics would likely experience the same iteration and revision process through practical application. In addition, the use of additional metrics to reflect additional climate-related risks and opportunities beyond CO2-e have also emerged (e.g. percentage of revenue from fossil fuel extraction), a process which is also likely to occur regarding biodiversity.

The TNFD will define metrics that are meaningful to corporates, financial institutions and broader stakeholders that will be required for TNFD-aligned reporting. These metrics will be arranged into three progressive stages of sophistication to provide organisations flexibility in implementation.[70]

What tools are available to assess biodiversity risk and opportunities?

There are a number of tools available for investors to assess their biodiversity risks and opportunities through measurement of the biodiversity impacts and dependencies of their portfolio. Tools that measure biodiversity impact are commonly referred to as 'footprinting tools'. These tools can assist investors to map companies' dependencies and impacts and to understand portfolio risk hotspots.[71]

[68] EU Business@ Biodiversity Platform, 2021, Finance for Biodiversity: Guide on biodiversity measurement approaches, https://www.financeforbiodiversity.org/wp-content/uploads/Finance-for-Biodiversity_Guide-on-biodiversity-measurement-approaches.pdf
[69] Svartzman, R., et al, 2021, A "Silent Spring" for the Financial System? Exploring Biodiversity-Related Financial Risks in France, https://publications.banque-france.fr/sites/default/files/medias/documents/wp826.pdf
[70] TNFD, 2021, Nature in Scope: A summary of the proposed scope, governance, work plan, communication and resourcing plan of the TNFD, https://tnfd.global/wp-content/uploads/2021/07/TNFD-Nature-in-Scope-2.pdf
[71] Business @ Biodiversity, 2019, Corporate Biodiversity Footprint applied to a portfolio of Agri-Food companies, https://ec.europa.eu/environment/biodiversity/business/assets/pdf/case-studies/Case%20study%206_CBF_Portfolio%20Agrifood_final.pdf

Table 9: Comparison of available biodiversity impact and dependency assessment tools

	Corporate Biodiversity Footprint (CBF)	Biodiversity Footprint Financial Institutions (BFFI)	Biodiversity Impact Analytics – powered by the Global Biodiversity Score (BIA-GBS)	Exploring Natural Capital Opportunities, Risks and Exposure (ENCORE)
Drivers considered	Land use change, climate change, pollution	Land/sea use change, direct exploitation, climate change, pollution, invasive species	Land/sea use change, direct exploitation, climate change, pollution	Land/sea use change, direct exploitation, climate change, pollution, invasive species
Coverage	Impacts	Impacts	Impacts and dependencies	Impacts and dependencies
Scope	Scope 1, 2 and 3	Scope 1, 2 and 3	Scope 1 and 2, Scope 3 (upstream)	Scope 1 and 2
Metric	MSA	PDF	MSA	MSA, STAR

Table 9 outlines the similarities and differences of four widely used tools that can be used to assess the biodiversity impacts and dependencies of listed equities.[72] Given the range of tools available, a business must consider its specific business context, resources and desired outputs before it can select a tool or tools. A number of resources are available to identify the tool most suitable to an organisation's needs, including those provided by Finance for Biodiversity Pledge, [73] the European Commission[74] and the Global WWF.[75]

Each of the above approaches addresses different aspects of risk and opportunity. Investors should consider applying different approaches to test the usability and usefulness of the data gathered.

In preparing this report, ACSI sought CBF data from Iceberg Data Lab for ten ASX-listed companies in the energy and mining sectors. The biodiversity impact assessment was based on publicly available data and was measured in terms of each company's total biodiversity impact on mean species abundance and relative to the amount of capital employed.

Investors can use footprinting data to estimate the biodiversity impact of different investments within their portfolio, identify the key drivers for this impact, and support decision-making on biodiversity risks and opportunities.[76] While useful, current footprinting tools are not without limitations, and should be used in conjunction with other tools to evaluate the biodiversity impacts and dependencies of companies more holistically.

The development of these tools is a rapidly evolving space and investors may wish to monitor their development to see how they can be utilised alongside other approaches. Guidance on the application of footprinting tools for investors is set out below.

[72] EU Business@ Biodiversity Platform, 2021, Finance for Biodiversity: Guide on biodiversity measurement approaches, https://www.financeforbiodiversity.org/wp-content/uploads/Finance-for-Biodiversity_Guide-on-biodiversity-measurement-approaches.pdf
[73] EU Business@ Biodiversity Platform, 2021, Finance for Biodiversity: Guide on biodiversity measurement approaches, https://www.financeforbiodiversity.org/wp-content/uploads/Finance-for-Biodiversity_Guide-on-biodiversity-measurement-approaches.pdf
[74] Lammerant, J., et al, 2021, Assessment of Biodiversity Measurement Approaches for Business and Financial Institutions, EU Business @ Biodiversity Platform, https://ec.europa.eu/environment/biodiversity/business/assets/pdf/EU%20B@B%20Platform%20Update%20Report%203_FINAL_1March2021.pdf
[75] Hilton, S. and Lee, J., 2021, Assessing Portfolio Impacts: Tools to Measure Biodiversity and SDG Footprints of Financial Portfolios, https://wwfint.awsassets.panda.org/downloads/wwf_assessing_portfolio_impacts_final.pdf
[76] Business @ Biodiversity, 2019, Corporate Biodiversity Footprint applied to a portfolio of Agri-Food companies, https://ec.europa.eu/environment/biodiversity/business/assets/pdf/case-studies/Case%20study%206_CBF_Portfolio%20Agrifood_final.pdf

Biodiversity footprinting

Measures the positive and negative impacts on biodiversity based on monitoring actual or expected biodiversity impact

What it can tell you

- Quantification of biodiversity impacts from direct operations and along the value chain
- The most material drivers of biodiversity loss based on available data
- With additional qualitative analysis, can inform biodiversity risk and opportunity assessments and guide business decisions

What it doesn't tell you

- Most tools do not consider biodiversity dependencies
- Without accurate and complete data, estimation of direct and indirect impacts can be uncertain
- Does not quantify the financial impact of risks or opportunities

Considering cumulative impacts and biodiversity value in investments

The available tools can support a high-level assessment of company and sectoral impact, but there are several limitations to evaluating the biodiversity impacts of investments. For example, tools and regulatory approaches currently available in Australia do not effectively consider cumulative biodiversity impacts.[77] As set out in the Samuel Review, taking a project-by-project approach instead of a cumulative approach to evaluating impact leads to the underestimation of impact and over time, can contribute to systemic risks.[78] There is currently no universally agreed approach for investor consideration of cumulative impacts, but there are opportunities to leverage existing landscape-level[79] conservation assessment and planning tools to do so (noting these tools have been designed to inform development planning rather than investment decisions).[80]

There are also opportunities for companies to collaborate to identify, reduce and mitigate the cumulative impacts of their activities. Examples of this exist for other high-risk commodities and specific ESG issues. For example, the Roundtable for Sustainable Palm Oil (RSPO) emerged out of a recognised need within the palm oil industry to respond to increased scrutiny over ESG issues in consumer markets.

Current tools use universal metrics (such as PDF and MSA) to indicate the scale of clearance or depletion and do not account for localised, unique biodiversity values. While universal metrics are useful in providing a primary assessment of impacts, they need to be supplemented with location-specific data to enable the accurate identification of risk hotspots and to prioritise impacts and mitigants.[81] This layering of universal metrics and location specific information is similar to the process undertaken in performing physical climate risk assessments.

In the case of biodiversity, this supplementary, geo-specific data should include information and an assessment of the site's importance for habitat connectivity, ecosystem sensitivity and persistence, endemicity of local species, and the presence of threatened or endangered species, as well as sites of cultural significance.[82]

[77] Samuel, G., 2020, Independent Review of the EPBC Act – Final Report, Canberra: Department of Agriculture, Water and the Environment, https://epbcactreview.environment.gov.au/resources/final-report
[78] NPI Alliance, 2015, Net Positive Impact for biodiversity: The conservation case, https://www.iucn.org/sites/dev/files/import/downloads/npi__conservation__01_2016_1.pdf
[79] Landscape-level assessments take into consideration biodiversity impacts across entire landscapes or ecosystems and move beyond localised and acute assessment of impacts linked to singular projects.
[80] World Economic Forum, 2016, Blueprints for a Greener Footprint: Sustainable Development at a Landscape Scale, https://www.conservationgateway.org/ConservationPractices/lands/dbd/Documents/Blueprint_for_a_Greener_WEF_FINAL.pdf
[81] Interview with Libby Pinkard, CSIRO.
[82] Rio Tinto 2020 Sustainability Fact Book, Available at: https://www.riotinto.com/en/invest/reports/sustainability-report

Case study: Rio Tinto biodiversity sensitivity

Rio Tinto reports on the biodiversity sensitivity of its operational sites that are owned, leased, managed in or adjacent to protected areas and areas of high biodiversity value. The biodiversity sensitivity of each operational site is evaluated through two criteria: relative biodiversity value and relative biodiversity vulnerability.

- The relative biodiversity value of an operational site is based on two underlying datasets: rarity weighted richness, and a natural and modified habitat screening layer.
- The relative biodiversity vulnerability of an operational site is based on two underlying datasets: rarity-weighted threatened species and a critical habitat screening layer.

By using the rarity-weighted datasets in conjunction with habitat screening layers to evaluate biodiversity sensitivity rankings, the importance of rare and potentially endemic species is considered. Rio Tinto's work to consider the value and sensitivity of the natural environment in which it operates is an example for investors looking to understand how both companies and investors can use information on location specific biodiversity value alongside more universal metrics.[82]

Frameworks for assessing and disclosing biodiversity impacts and dependencies

There are a number of frameworks in place or under development which companies may use to assess their biodiversity impacts and dependencies, set targets, and disclose their related risks and opportunities. However, given the ongoing development of many of these frameworks, the ability for investors to adopt these frameworks varies. Some of the most prominent frameworks are set out in Table 10, with additional detail in the Appendix.

Table 10: Frameworks for assessment and disclosure of biodiversity impacts

Assessment	Target-setting	Disclosure
Provide a methodology for assessing the biodiversity impacts and dependencies of the organisation or investor	Provide methodology for companies and investors to set meaningful and actionable biodiversity-related objectives and goals	Provide methodology for companies to report biodiversity risks and opportunities to enable transparent and consistent reporting
• UN System of Environmental Economic Accounting • IUCN Guidelines for Planning and Monitoring Corporate Biodiversity Performance • Natural Capital Protocol • Partnership for Biodiversity Accounting Financials • Biological Diversity Protocol* • Natural Capital Finance Alliance* • EU Align Project*	• The Global Apex Goal for Nature • International Finance Corporation Performance Standard 6 • UN CBD Global Biodiversity Framework* • European Union Biodiversity Strategy for 2030 and EU taxonomy* • Science-Based Targets for Nature*	• Global Reporting Initiative (GRI 304) • Sustainability Accounting Standards Board Standards • Value Reporting Foundation • Carbon Disclosure Project Forest Program • TNFD* • Finance for Biodiversity Pledge* • Climate Disclosure Standards Board Biodiversity Guidance* • Carbon Disclosure Project/BNP Paribas biodiversity reporting metrics* * Under development

To date, none of these frameworks have been widely adopted or have emerged as the industry standard. The recent announcement by the IFRS Foundation Trustees to establish an International Sustainability Standards Board will likely impact these frameworks over time. The TNFD (which is currently under development) is expected to catalyse action on biodiversity and drive greater alignment in the financial services sector as the TCFD has for climate.

The stated goal of the TNFD is to 'support a shift in global financial flows away from nature-negative outcomes and toward nature-positive outcomes.'[83]

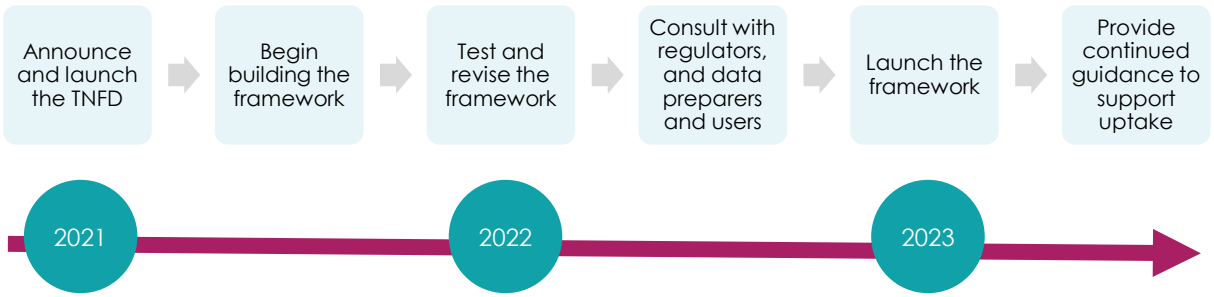
The TNFD, which is expected to be formally launched in 2023, aims to provide companies with a framework to manage and disclose nature-related risks. The TNFD are expected to release a 'beta' framework in February 2022 to be tested and refined through pilots. The TNFD leverages the TCFD's four-pillar approach to disclosure: governance, strategy, risk management, and metrics and targets. However, the TNFD adopts a broader approach to risk and opportunities by focusing on how the organisation impacts nature as well as how nature may impact the company's financial performance. The four-pillar approach used by the TNFD is shown in Figure 7.

Even with a globally agreed standard, the localised nature of biodiversity-related risks and dependencies means that best practice disclosure will need to be country, geography or region specific. To date, such a framework has yet to be developed for the Australian context.

The draft timeline for the development of the TNFD is set out in Figure 8: TNFD framework timeline.

Figure 7: Four-pillar approach of the TNFD

Figure 8: TNFD framework timeline[84]



[83] TNFD, 2021, About – TNFD, https://tnfd.global/about/
[84] TNFD, 2021, Twitter - TNFD, https://twitter.com/TNFD_/status/1425502758455631872/photo/1

The role of sustainability ratings agencies

Many sustainability ratings agencies are already developing and integrating ratings for biodiversity into their broader ESG ratings processes. For example, MCSI has incorporated biodiversity loss as an input into the methodology behind its MSCI Global Environment Index[85] and also provides an assessment of companies' controversies as they relate to negative environmental impacts (amongst other ESG impacts) in its MSCI ESG Controversies assessment.[86]

Sustainability risk and ratings providers are expected to be an increasingly useful source of information for investors on company management of biodiversity risks and opportunities, particularly as the understanding of the nuances around biodiversity grows and matures. Investors should engage with rating agencies ahead of the release of the TNFD to understand how ratings agencies propose to assess disclosures. This will help ensure the approach taken enables investors to best understand and compare companies' biodiversity loss related risks and opportunities and their management.

Global investor action

Reversing the decline in biodiversity by 2030 will take an estimated annual global investment of up to USD967 billion.[87] This will only be achieved with the injection of private capital; traditional government and philanthropic funding has so far been inadequate for the scale of the challenge.

Recent surveys have identified that most investors have limited awareness of the financial risks and opportunities presented by biodiversity and lack relevant commitments and investment policies.[88] To date, investor action on biodiversity has been led largely by European firms including AXA, BNP Paribas and Caisse des Dépôts, which have all developed investment strategies and have been active in co-developing tools and frameworks to support broader action. Firms such as Federated Hermes have also begun to engage with companies to better understand their biodiversity impacts and dependencies.

Over the past 12 months, there has been growing interest in addressing biodiversity loss risks, with increased discussion driven by the emergence of frameworks such as the TNFD. Broader investor initiatives are also beginning to materialise. For example, the World Bank has proposed forming a Nature Action 100+ (leveraging the Climate Action 100+ model) to support coordinated investor engagement.[89]

[85] MSCI, 2020, MSCI Global Environment Index Methodology, https://www.msci.com/eqb/methodology/meth_docs/MSCI_Global_Environment_Index_Feb2020.pdf
[86] MCSI, n.d, MSCI ESG Controversies, https://www.msci.com/documents/10199/acbe7c8a-a4e4-49de-9cf8-5e957245b86b
[87] Paulson Institute, 2021, Financing Nature: Closing the Global Biodiversity Financing Gap - Paulson Institute, https://www.paulsoninstitute.org/key-initiatives/financing-nature-report/
[88] Responsible Investor Research, 2021, Unearthing investor action on biodiversity, https://www.responsible-investor.com/reports/responsible-investor-and-credit-suisse-or-unearthing-investor-action-on-biodiversity
[89] Stewart, F. and Power, S., 2021, Nature Action 100: A proposal for targeted investor engagement on biodiversity, World Bank Blogs, https://blogs.worldbank.org/psd/nature-action-100-proposal-targeted-investor-engagement-biodiversity

The consideration of First Nations' issues in the EPBC Act

The Samuel Review states that the current state of incorporating First Nations perspectives and systems into biodiversity management reflects an overall culture of tokenism and symbolism, rather than one of genuine inclusion of First Peoples. The review recommends normalising the incorporation of First Peoples' knowledge in environmental management planning and environmental impact assessment through culturally appropriate engagement.

It also highlights that ensuring and facilitating free, prior and informed consent is critical to that process. This engagement deficit is reflected across many Federal Government programs that interact with biodiversity and cultural values. Until very recently, there were no cultural consultation requirements for major projects and the cultural value of threatened species is still often not appropriately considered.

The state of play in Australia

If the state of biodiversity disclosure in Australia is an indication of the broader level of risk understanding and management, there is a lot of work to be done to prepare for the TNFD. Current biodiversity disclosures are limited in scope and depth, with Australian companies primarily disclosing only direct, immediate impacts and not indirect (value chain) impacts or dependencies (and many provide no disclosure at all). As noted in the Samuel Review, biodiversity regulation in Australia is outdated and requires fundamental reform.[90] While there is a clear path forward for legal reform, Australian investors do not need to wait for this to begin the work to understand and manage biodiversity loss related risks.

Australia's policy environment

Changes to biodiversity-related policy at local, national and international levels are required to improve biodiversity outcomes.

Despite the well-documented decline in Australia's biodiversity,[91] Australia's biodiversity policy and funding has not responded with domestic government expenditure on biodiversity and associated administrative functions remaining at AUD400–500 million annually over the last decade.[92]

In Australia, the key federal environmental legislation is the Environment Protection and Biodiversity Conservation (EPBC) Act, one of the objectives of which is to promote the conservation of biodiversity. This is supplemented by national, state and local biodiversity conservation frameworks. The Samuel Review identified significant opportunities to update the EPBC Act, with a number of recommended reforms identified, some of which are detailed in Table 11 below.

[90] Samuel, G., 2020, Independent Review of the EPBC Act – Final Report, Canberra: Department of Agriculture, Water and the Environment, https://epbcactreview.environment.gov.au/resources/final-report
[91] Australia State of the Environment, 2016, Australia State of the Environment 2016: State and Trends, https://soe.environment.gov.au/theme/overview/framework/state-and-trends
[92] Convention on Biological Diversity, 2019, Australia: Financing for Biodiversity, https://www.cbd.int/financial/australia.shtml

Table 11: A selection of issues identified and recommended reforms from the Samuel Review[93]

Gap identified by the Samuel Review	Recommended reforms
The EPBC Act does not enable the government to effectively protect and conserve matters of national environmental and heritage significance	Implement National Environmental Standards for matters of national environmental significance (e.g. threatened species)
There is a lack of trust in the EPBC Act and limited transparency in the decision-making process	Increase the transparency of the EPBC Act's operation (e.g. require publication of all reasons for decisions made under the EPBC Act, and increase the availability of information)
There are concerns that the decision-making processes of States and Territories is too discretionary and that it is inconsistent with national obligations and interest	Require the independent audit of State and Territory arrangements to deliver environmental approvals
The EPBC Act does not adequately manage cumulative impacts and emerging threats	Consider the cumulative impacts, past and future threats, and environmental resilience in a changing climate
There is a lack of private sector participation in environmental restoration activities	Foster private sector participation in restoration (e.g. leveraging carbon markets)

If implemented, these reforms present both risks and opportunities for Australian businesses. For example, the recommended reforms to penalty provisions may present significant regulatory risk over the short-term. However, the reforms provide opportunities for business insofar as they propose to remove some processes which are 'costly to business and result in little tangible benefit to the environment', thereby improving outcomes for both businesses and the environment.[94]

The Australian Government's response to the review noted that reform is 'long overdue' and committed to adopt a number of the recommendations by 2022.[95] However, the response put forward by the Australian Government to date does not address the full suite of reforms recommended by the Samuels Review, such as efforts to foster private sector participation.[96]

Another recent development in Australia's response to biodiversity loss risk was the launch of *Australia's Strategy for Nature 2019-2030* in 2019. The Strategy was released by the Commonwealth, all state and territory governments and the Australian Local Government Association (ALGA). It sets out a shared roadmap to 'better understand, care for and sustainably manage nature to 2030'.

The Strategy was launched alongside the Australian Nature Hub website, which provides a consolidated list of commonwealth, state and territory 'actions' relating to nature. As part of the strategy, an interjurisdictional Biodiversity Working Group has been established, comprising representatives from the federal, state and territory governments and ALGA.[97]

The Australian Government has also recently released the *Threatened Species Strategy 2021-2031*. This strategy aims to provide a framework to protect and recover Australia's threatened species through eight action areas, including conserving and restoring habitats, climate change adaptation, effective conservation planning, and improving knowledge and tools.[98] Although funding for implementation of these strategies has not been announced, these strategies indicate a direction of travel for Australian biodiversity and should be considered by companies and investors in assessing biodiversity risks and opportunities. As noted in the Section titled 'Biodiversity and nature loss', in November, the Government also committed to joining the TNFD Forum and to providing strategic funding support to the initiative.

[93] Samuel, G., 2020, Independent Review of the EPBC Act – Final Report, Canberra: Department of Agriculture, Water and the Environment, https://epbcactreview.environment.gov.au/resources/final-report
[94] Samuel, G., 2020, Independent Review of the EPBC Act – Final Report, Canberra: Department of Agriculture, Water and the Environment, https://epbcactreview.environment.gov.au/resources/final-report
[95] Commonwealth of Australia, 2021, A pathway for reforming national environmental law, Department of Agriculture, Water and the Environment, https://www.awe.gov.au/sites/default/files/documents/pathway-reforming-national-environmental-law.pdf
[96] Evans, M., 2021, RE: Environment Protection and Biodiversity Conservation Amendment (Standards and Assurance) Bill 2021, https://megancevans.com/wp-content/uploads/2021/06/Evans_EPBC-Standards-and-Assurance-Bill-submission.pdf
[97] Commonwealth of Australia, 2019, Australia's Strategy for Nature 2019–2030, https://www.australiasnaturehub.gov.au/sites/default/files/2020-11/australias-strategy-for-nature.pdf
[98] Australian Government, 2021, The Australian Government's Threatened Species Strategy 2021–2031, Department of Agriculture, Water and the Environment, https://www.awe.gov.au/sites/default/files/documents/threatened-species-strategy-2021-2031.pdff

Australian-led initiatives

The Australian Sustainable Finance Institute (ASFI) is a collaboration of major banks, superannuation funds, insurance companies, financial services sector peak bodies and academics that aims to shape an Australian economy that prioritises human well-being, social equity and environmental protection, while underpinning financial system resilience and stability. The AFSI Sustainable Finance Roadmap[99] was launched in 2021 and sets out a plan for aligning Australia's financial system with a sustainable, resilient and prosperous future for all Australians. As part of the roadmap, a priority special project for AFSI will be developing guidance for nature-related financial disclosures that is aligned to Australia's biodiversity challenges. AFSI will actively engage with the TNFD framework development process. The roadmap also flags AFSI's plans to expand the scope of climate scenario analysis to include other sustainability impacts, including biodiversity loss. In 2021, the Responsible Investment Association of Australasia (RIAA) established a nature working group and more than 200 members attended the inaugural meeting. This indicates a significant interest in this issue from the Australian investment community.

Pathway to EPBC Act reform

The Australian Government has proposed a pathway for the initial stages of reform:

- **2021** 'Establishing priority reforms' (e.g. interim National Environment Standards, modernising systems, increasing transparency). The Government has commenced work on many of the priority reforms.
- **2021-22** 'Implementation' (e.g. review of interim National Environment Standards, independent oversight and audit, project-level compliance and enforcement)
- **2022+** 'Review and further reform' (e.g. proposed final National Environment Standards, further modernisation)[95]

The current state of disclosure in Australia

An assessment of the biodiversity disclosures of 11 ASX-listed companies from a representative sample range of sectors reveals that there is significant work to be done to meet the demands of emerging disclosure frameworks such as the TNFD. Many of the disclosures assessed were limited in scope and depth, primarily disclosing only direct, immediate impacts, and not indirect (value chain) impacts or dependencies. Based on the disclosures reviewed, it appears that Australian companies have not yet assessed the full magnitude of their biodiversity risks and opportunities, despite their prevalence throughout the economy.

The assessment involved a preliminary scan of approximately 40 companies, of which 11 companies were selected for a detailed assessment, based on the quality of their disclosures and the need for cross-sectoral representation (mining, energy, financial, real estate, agriculture and logistics). The disclosures were assessed against the four pillars of the TNFD, with sub-categories under each pillar based on the TCFD recommended disclosures.

[99] Australian Sustainable Finance Initiative, 2020, A plan for aligning Australia's financial system with a sustainable, resilient and prosperous future for all Australians. https://static1.squarespace.com/static/5c982bfaa5682794a1f08aa3/t/5fcdb70bfe657040d5b08594/1607317288512/Australian+Sustainable+Finance+Roadmap.pdf

Results of the assessment are summarised in Table 12. Many of the disclosures could be described as leading practice within the ASX, however, the assessment also found:

- Across all sectors, biodiversity disclosure is limited or non-existent. The most mature disclosures related to biodiversity policies in the materials and real estate industries. Notably, these policies were limited in their coverage of the extent of physical and transition risks and opportunities.
- Biodiversity loss risk identification is generally limited to direct and acute transition risks, rather than indirect or chronic transition risks, or physical risks (i.e. dependencies). Further, there was limited analysis of biodiversity opportunities, and there was inadequate qualitative data to assess the financial impact of these risks and opportunities.
- While most of the organisations had some biodiversity-related metrics or targets in place, they were generally limited to biodiversity impacts, or restoration activities, rather than dependencies. The targets are commonly qualitative improvements rather than a quantitative outcome. Companies are starting to act on biodiversity, including through the alignment to a range of biodiversity frameworks, however, many have room for improvement.

Table 12: Assessment of 11 ASX companies' biodiversity disclosures (average score of companies within sector presented)

		Materials	Real Estate	Industrials	Financials	Consumer Staples	Energy
Governance	Governance of biodiversity						
Strategy	Physical risk identification*						
	Transition risk identification*						
	Biodiversity opportunities						
	Qualitative data on biodiversity risk						
Risk management	Biodiversity policies						
	Risk management approach						
	Additional actions or plans						
	Reference to reporting frameworks						
Metrics and targets	Metrics for assessing impact						
	Biodiversity-related targets						
	Overall rating						

Key

Minimal disclosure by companies in sector

Some discussion/disclosure by companies in sector

Detailed discussion/disclosures by companies in sector

* For the purposes of the desktop assessment, a company has been assessed as having disclosed their physical risks where they have disclosed their dependencies on biodiversity and having disclosed their transition risks where they have disclosed their impacts on biodiversity.

The challenges of biodiversity offsets

Biodiversity offsets are commonly used on Australian projects in accordance with the federal and state policies.[100] Offsets are intended to provide a mechanism to compensate for biodiversity impact that cannot otherwise be avoided reduced or minimised. Three commonly used biodiversity offsets are:[101]

- Averted loss offsets protect otherwise at-risk areas of land with the same type of habitat that was destroyed or damaged by the development.
- Restoration offsets rehabilitate or restore degraded land, leading to the creation of new habitat.
- Advanced offsets are provided in advance of any impact occurring, where the offset area is set aside for potential future use by the owner or to sell to another developer.

The use of offsets relies on the premise that biodiversity loss can be equally compensated for if sufficient activity is undertaken to protect, enhance or establish biodiversity elsewhere. However, this premise does not hold true where the impacted biodiversity is extremely vulnerable, where no offset site is available, or where there is no known approach to achieving the required offset outcome.[102] In these instances, offsets are unable to adequately compensate for the biodiversity impact and other measures are needed to limit the impact, such as denying the approval of the project. To date, very few projects referred to the Minister under the EPBC Act have not been approved: in the 19 years from the introduction of the EPBC Act to 2019, 1,050 projects have been approved, with only 11 not approved.[103]

Consideration of cultural value in biodiversity offsets

There is currently no requirement to consider cultural value as part of the biodiversity offset process. As such, even projects which utilise biodiversity offsets can have substantial adverse impacts to cultural heritage.

While there has been some broader discussion about the potential development of offsets for cultural heritage, these should be approached with caution. Cultural value is often priceless and cannot be offset by the provision of compensation alone. There is also some concern that use of offsets for cultural heritage can lead to the normalisation of the destruction of cultural heritage. Investors should be wary of unmitigated risk to cultural value, even on projects which utilise offsets.

The use of offsets to compensate for biodiversity loss means that their use rarely results in net positive biodiversity impacts, though the more ambitious goal of improving outcomes is receiving increasing global attention.[104] For this reason, the use of offsets alone should not be considered as a mechanism to finance biodiversity conservation or recovery.

The Samuel Review noted the potential for offsets to improve environmental outcomes but found that the EPBC Act's current offset policy 'contributes to environmental decline rather than active restoration'.[105] Similarly, a recent report by the Australian National Audit Office noted the 'absence of guidance and quality control in offset assessment has resulted in realised risks'.[106] While the current policy includes a mitigation hierarchy (to first avoid, mitigate and rehabilitate, and to offset only as a last resort) similar to that shown in Figure 9, many developers are using offsets by default rather than taking considered actions to mitigate a project's negative impacts on biodiversity. The Samuel Review raised several failings of the current policy and noted many offsets provide only 'weak protection' for habitats which wouldn't have otherwise been at risk.[107]

Figure 9: Mitigation Hierarchy

[100] Maron, M., Bull, J., Evans, M. and Gordon, A., 2015, Locking in loss: Baselines of decline in Australian biodiversity offset policies. Biological Conservation, 192, pp.504-512.
[101] Samuel, G., 2020, Independent Review of the EPBC Act – Final Report, page 138, Canberra: Department of Agriculture, Water and the Environment, https://epbcactreview.environment.gov.au/resources/final-report
[102] OECD, 2016, Biodiversity Offsets: Effective design and implementation, https://www.oecd.org/environment/resources/Policy-Highlights-Biodiversity-Offsets-web.pdf
[103] Australian National Audit Office, 2020, Referrals, Assessments and Approvals of Controlled Actions under the Environment Protection and Biodiversity Conservation Act 1999, https://www.anao.gov.au/sites/default/files/Auditor-General_Report_2019-2020_47.pdf
[104] Moilanen, A. and Kotiaho, J., 2020. Three ways to deliver a net positive impact with biodiversity offsets. Conservation Biology, 35(1), pp.197-205.
[105] Samuel, G., 2020, Independent Review of the EPBC Act – Final Report, Canberra: Department of Agriculture, Water and the Environment, https://epbcactreview.environment.gov.au/resources/final-report
[106] Australian National Audit Office, 2020, Referrals, Assessments and Approvals of Controlled Actions under the Environment Protection and Biodiversity Conservation Act 1999, https://www.anao.gov.au/sites/default/files/Auditor-General_Report_2019-2020_47.pdf
[107] Samuel, G., 2020, Independent Review of the EPBC Act – Final Report, Canberra: Department of Agriculture, Water and the Environment, https://epbcactreview.environment.gov.au/resources/final-report

Investor action plan

Significant knowledge and capacity building is necessary to enable the Australian investment community to address the scale and significance of biodiversity loss risks. While the evolving policy environment creates uncertainty about future regulatory requirements for biodiversity risk and opportunity management, there is sufficient information about the issue to enable investors to act now. To support this, we have identified five critical actions for investors to take to begin to understand and manage biodiversity risk and opportunities and to prepare to respond to the inevitable introduction of the TNFD. These actions are summarised over the following pages, with additional detail in the **Investor Biodiversity Action Plan** at the end of this section.

Five critical recommendations for investors

Figure 10: Five critical recommendations for investors

Plan and educate

Investors should develop a clear plan for understanding and managing biodiversity loss risks and build the capability and competence of their organisation and portfolio companies to execute the strategy. Investors should first focus on upskilling relevant internal staff to understand and manage biodiversity loss risks. This may start with identifying opportunities for cross-industry collaboration.

In time, investors should consider how to embed biodiversity into responsible investment strategies and, where appropriate, develop standalone biodiversity risk policies that are aligned to the draft TNFD Framework. These policies should be updated as the TNFD is finalised and in line with evolving stakeholder expectations. The TNFD timeline is set out on page 31 of this report.

Summary of recommended actions to plan and educate

- Develop a plan for **implementing** the organisation's biodiversity-related objectives and for managing the risks and opportunities to the portfolio.
- **Upskill staff** on biodiversity risks and opportunities and the risk management approach.
- Establish a **formal policy** that defines the organisation's approach to managing biodiversity risks and opportunities, with specific reference to long-term value creation and to fiduciary or other duties owed to beneficiaries or clients. The policy should include clear goals and commitments, such as alignment to the TNFD and setting associated targets.
- Build **accountability** by assigning roles and responsibilities between the ESG and investment teams for overseeing and implementing the organisation's commitments on biodiversity, and for reporting on biodiversity performance.
- Engage with **ESG risk rating** agencies to understand how they are evaluating biodiversity disclosures and biodiversity risk.

Corporate engagement

The most immediate priority for investors is to open lines of communication and to understand the current state of biodiversity loss risk management within their portfolios.

Summary of recommended actions for corporate engagement

- **Communicate** to companies that you are starting to consider biodiversity loss risks and opportunities and establish expectations for company biodiversity outcomes.
- **Engage** with companies operating in sectors with significant impacts and dependencies to understand current maturity in capability, risk assessment, data availability and disclosure. The frameworks set out in the section 'The global response' can be used as a starting point to guide company disclosure.
- Engage with companies to enable an **assessment of portfolio biodiversity** impacts and dependencies, with consideration of both geographic location and supply chain of investments.
- Use the results of the risk assessment process set out below to **identify target companies** for ongoing engagement.

Globally, investors are already engaging companies within their portfolio on biodiversity impacts and dependencies. For example, Hermes EOS engages with companies to encourage them to assess their biodiversity dependency and resulting risks and opportunities, and to 'understand, mitigate and reverse' negative biodiversity impacts, including mitigating their contribution to biodiversity loss drivers (e.g. climate change).

Hermes EOS encourages companies to achieve net positive biodiversity impacts through use of the mitigation hierarchy: avoid impact, minimise remaining impact, rehabilitate habitat, and offset the remaining impact as a last resort.[108] By comparison, focus by Australian investors is in its infancy. Table 13. sets out expectations and guiding questions, aligned to the TNFD, that Australian investors could use to begin corporate engagement.

[108] Likhtman, S., 2021, Our Commitment to Nature: biodiversity and sustainable land use through engagement. [online] Federated Hermes, https://www.hermes-investment.com/au/wp-content/uploads/2021/02/eos-our-commitment-to-nature-spreads.pdf

Table 13: Investor expectations and guiding questions

	Investor expectations	Questions to ask
Governance	The board has oversight over biodiversity risks and opportunities Management takes an active role in assessing and managing biodiversity risks and opportunities, and has sufficient knowledge and resources to do so	• What is the level of board oversight over biodiversity risks and opportunities? • What is management's role in assessing and managing biodiversity risks and opportunities?
Strategy	The company has identified its physical, transition and systemic biodiversity risks and opportunities over the short, medium, and long term The company has assessed the quantitative impact of material biodiversity risks on its business, strategy and financial planning The company's strategy is resilient to these risks and capitalises on these opportunities	• Has the company mapped its impacts and dependencies? • What are the company's physical, transition and systemic biodiversity risks and opportunities in the short, medium and long term? • What is the impact of these risks and opportunities on business, strategy and financial planning? Has this impact been quantified? • Is the company's strategy resilient to these risks? Does the strategy capitalise on these opportunities?
Risk management	The company has a robust process to identify, assess and manage physical, transition and systemic biodiversity risks, considering both impacts and dependencies, which is integrated into the company's overall risk management process The company's biodiversity risk management process follows the risk mitigation hierarchy This process integrates consideration of other nature-related risks (e.g. climate risk, water risk) and the company's broader sustainability strategy	• What policies or processes are in place to identify and assess biodiversity risks? • Does the company have and adhere to a mitigation hierarchy for managing biodiversity risks? If so, what biodiversity impacts have been avoided, mitigated, rehabilitated and offset? • How are these biodiversity risks managed, and how does this feed into the company's overall risk management process and sustainability strategy?
Metrics and targets	The company has metrics to assess, and targets to manage, its biodiversity risks and opportunities These metrics and targets reflect the magnitude of that company's biodiversity impacts and dependencies	• What metrics does the company use to assess its biodiversity risks and opportunities? • What targets does the company have in place to manage its biodiversity risks and opportunities? How do these targets relate to other targets that the company has in place? How will progress against this target be measured?

Use of proxy voting on biodiversity

To date, the use of proxy voting on biodiversity has been limited.[109] Based on the use of proxy voting on related topics such as deforestation and waste, and reference to proxy voting in some leading investors' strategies, this may change in the future. For example, the BNP Paribas Biodiversity Roadmap signals an intention to continue showing strong support for sustainability-focused shareholder proposals and notes the business will consider submitting its own proposals focused on the biodiversity crisis.[110]

[109] Grigg, A., Yacob, L. and James, G., n.d. INVESTOR ACTION ON BIODIVERSITY: DISCUSSION PAPER, PRI, https://www.unpri.org/download?ac=11357
[110] BNP Paribas Asset Management, 2021, SUSTAINABLE BY NATURE: OUR BIODIVERSITY ROADMAP, http://am.bnpparibas.com/01-australia/bnpp-am_sustainable-by-nature---our-biodiversity-roadmap_aus_final.pdf

Manage portfolio risks and opportunities

Australian investors should undertake a methodical process to identify, assess and address material biodiversity-related risks and opportunities in their portfolios. This process should consider both direct and indirect, physical, transition and systemic risks and opportunities, noting that the tools to do this are rapidly evolving.

Summary of recommended portfolio risk and opportunity management actions

Investors should identify, assess and address material biodiversity loss risks in their portfolios:

- Conduct a **high-level portfolio assessment** to identify areas of greatest risk and opportunity, and their concentration across asset classes, for example using biodiversity footprinting tools.
- Use the high-level portfolio risk assessment to **identify concentrations of risk** or risk hotspots within asset classes and consider actions to manage exposure to biodiversity loss risks and opportunities.
- Where possible, **quantify financial impacts** of material risks and opportunities at both the asset class and transaction level, noting limitations of current tools.
- Develop processes for **ongoing risk and opportunity assessment** and refine investment criteria regularly to reflect the evolving understanding and expectations around biodiversity.
- Consider **aligning your portfolio** to international biodiversity standards and frameworks.

Where investors use existing tools to support this risk and opportunity assessment process, they should ensure that the full scope of risks and opportunities is considered, beyond those linked to acute, direct impacts. While biodiversity footprinting data is a valuable input into this risk and opportunity identification process, most tools will not provide a full picture of the spectrum of dependencies and impacts across a company's value chain. Further information on the application of footprinting tools for investors is set out in the section titled 'The Global Response'.

Shape policy and framework development

Australian investors should consider opportunities to become actively involved in the development of relevant frameworks, and to participate in policy advocacy to address systemic biodiversity loss risks. At a minimum, investors should stay up to date with the development of the TNFD to develop readiness to respond when the framework is launched. Investors should also consider working towards alignment with other international frameworks, such as the Finance for Biodiversity Pledge.

In Australia, the Samuel Review has provided a clear set of recommendations to improve the regulation of biodiversity, which investors should review and consider supporting, given the role of regulation in managing risk. More broadly, there are numerous opportunities for investors to advocate for enhanced management of biodiversity to limit their exposure to biodiversity loss risk.

The 'Investor Climate Action Plan'

(ICAP) calls out policy advocacy, including lobbying, as a core component of the investor response to climate change. The ICAP states that investors should 'ensure that all lobbying activities carried out by the investor are aligned with the goals of the Paris Agreement.' As the Federal Government works through the EPBC Act review recommendations, Australian investors, and companies should consider the alignment between their policy and advocacy activities and biodiversity outcomes.

This includes supporting:

1. Development of national biodiversity targets aligned to the UN CBD Global Biodiversity Framework, a pathway to reaching targets, and regional and sectoral guidance.
2. Requirements for data transparency and centralised reporting of biodiversity impacts by embedding requirements into development regulations.
3. Public and private financing to catalyse activities which support returns and improving biodiversity outcomes (e.g. biodiversity-linked loans).
4. The introduction of mandatory disclosure requirements for Australian companies regarding their exposure to biodiversity loss risk and subsequent risk management approach, considering both impacts and dependencies (e.g. Australian Prudential Regulation Authority's prudential practice guide on climate change financial risks).[111] [112] [113] [114]
5. Ensuring that the evaluation of biodiversity risk is holistic, and includes effective consideration of cumulative impacts and cultural values, including cultural ecosystem services provided to First Peoples.
6. Embedding First Peoples into decision-making, particularly where biodiversity values and cultural values are both present.

Investor action on climate change has demonstrated that investors can successfully engage in policy advocacy to address systemic and economy-wide risks to their portfolios.

Investors have a unique role to play in driving these reforms given the magnitude and breadth of their potential exposure to biodiversity loss risk, which is due in part to a lack of policy intervention to date.

While policy reform is an important lever, investors must be aware that regulation and laws set the minimum course for action and performance, and are a lag indicator.[115] To understand and tackle biodiversity loss risks effectively, investors must act even in the absence of specific regulation.

Summary of recommended policy and framework actions

- Monitor and support **collective engagement** to encourage better governance, management and disclosure of biodiversity risks and opportunities.
- **Engage** directly with companies, asset managers, industry forums and other entities to encourage better governance, management and disclosure, including in relation to lobbying activities and industry memberships.
- Support **collaborative investor statements** calling on governments to accelerate private sector investment into biodiversity management and to improve biodiversity related disclosures.
- Engage with **policy makers** to support regulatory reform to increase focus on biodiversity management globally.
- Participate in **investor networks** and contribute to the organisation's advocacy activities.

[111] ShareAction, 2020, Biodiversity: a scoping report, https://api.shareaction.org/resources/reports/Biodiversity-scoping-report-Final.pdf
[112] Suttor-Sorel, L., 2019, Making Finance Serve Nature, Finance Watch, https://www.finance-watch.org/wp-content/uploads/2019/05/Making-Finance-Serve-Nature_Finance-Watch-Report_24May2019_web.pdf
[113] World Bank Group, 2020, MOBILIZING PRIVATE FINANCE FOR NATURE, https://thedocs.worldbank.org/en/doc/916781601304630850-0120022020/original/FinanceforNature28Sepwebversion.pdf
[114] Publications UK Parliament, 2021, Biodiversity in the UK: bloom or bust?, https://publications.parliament.uk/pa/cm5802/cmselect/cmenvaud/136/136-report.html#heading-7
[115] Interview with Geoff Summerhayes, Senior Advisor, Pollination Group and former APRA Commissioner.

Monitor and disclose

Enhanced investor understanding of biodiversity risks and opportunities, will be supported by the development of complementary systems and processes to monitor company risk management and disclosures. In turn, investors should monitor and disclose their own risk management approach at the portfolio level.

Summary of recommended monitoring and disclosure actions

- Where risks are material, publish a **public statement** recognising that biodiversity loss presents new and material challenges, and that it requires an organisation-wide commitment to integrating related risks and opportunities into investment practice.
- **Identify companies' existing biodiversity-related metrics, targets and KPIs**, and put in place a system to track performance disclosures and act where performance is not in alignment with expectations. In time, assess company disclosures for alignment to TNFD recommendations.
- **Define and communicate** expectations for company disclosures on biodiversity.
- Develop a **monitoring program** for internal and external alignment to the organisation's biodiversity strategy and commitments, including defined metrics and KPIs, and regularly and transparently disclose progress against the strategy.

Investor biodiversity action plan

	Horizon 1	Horizon 2	Horizon 3
Plan and educate	• Support targeted upskilling on biodiversity risk and opportunity management • Embed active consideration of biodiversity issues into ESG sectoral analysis • Engage with ESG risk rating agencies to understand how they are evaluating biodiversity disclosures and biodiversity risk	• Provide training to staff on biodiversity risks and opportunities and the implications for investment • Define an approach to assess biodiversity impacts and dependencies, understand risks and opportunities, and improve biodiversity outcomes • Establish a formal policy that defines the organisation's approach to managing biodiversity risks and opportunities, with specific reference to long-term value creation and to the fiduciary / other duties owed to beneficiaries or clients	• Undertake a skills and competencies assessment • Define roles and responsibilities for: overseeing and implementing the organisation's commitments on biodiversity, and for reporting on biodiversity performance • Develop a plan for delivering on the organisation's biodiversity-related objectives and for managing the risks and opportunities to the portfolio • Define company disclosure requirements and communicate them
Corporate engagement	• Communicate to companies your consideration of biodiversity as an emerging material issue • Engage directly with companies, asset managers, industry forums and other entities to encourage better governance, management, and disclosure of biodiversity • Assess portfolio biodiversity impacts and dependencies to inform Horizon 2	• Target, and engage with, higher-risk companies to manage impacts and dependencies across their value chains • Communicate investment criteria to companies and support company upskilling • Target and engage with high-risk companies to determine maturity of biodiversity risk assessment, management, and disclosure	• Continue to engage on biodiversity, tailoring engagement approach to meet evolving TNFD expectations and sector-specific risks and opportunities • Ensure that most of the companies in the portfolio have business strategies or have committed to establishing such strategies • Consider proxy voting as a means to engage with companies
Manage portfolio risks and opportunities	• Perform high-level portfolio assessment to identify the material biodiversity risks and opportunities, considering cultural values	• Undertake a financial impact assessment for physical, transition and systemic biodiversity risks in the portfolio and identify concentrations of risk across asset classes • Where possible, quantify financial impacts of material risks and opportunities at both the asset class and transaction level • Define initial investment criteria	• Establish a clear escalation strategy for companies or other entities that have not responded appropriately to engagement on biodiversity • Perform annual risk and opportunity assessment • Refine investment criteria to consider identified material biodiversity risks and opportunities along with corresponding financial impacts (if applicable) • Consider the benefits of aligning your portfolio to international biodiversity standards and frameworks.
Shape policy and framework development	• Monitor emerging tools and frameworks • Constantly improve the quality of the data used and the approach taken by monitoring and potentially adopting new tools and frameworks as they become available • Support collaborative investor initiatives and statements	• Engage with Australian and global policy makers • Encourage policy reform which increases focus on biodiversity risks and opportunities, and improves biodiversity outcomes at local, national, and global levels • Review lobbying and industry association memberships to ensure they are aligned to preservation of biodiversity.	• Provide public support and play an active role in discussion of sustainable finance policy and regulatory measures for biodiversity risk management • Participate in investor networks and contribute to companies' advocacy activities
Monitor and disclose	• For investments in sectors with the greatest biodiversity impacts and dependencies, assess current disclosures against the draft TNFD framework • Gather and consolidate available metrics, targets and KPIs • Consider publishing a formal statement recognising that biodiversity loss presents new and material challenges, and requires an organisation-wide commitment to integrating related risks and opportunities into investment practice	• Establish a monitoring program for internal and external alignment to the strategy, including defining metrics and KPIs • Determine and publish a performance baseline for the portfolio • Define and communicate expectations for company disclosures on biodiversity	• Develop and embed company monitoring into existing systems and processes • Publish assessment of the outcomes and impacts achieved from corporate engagement • Publish an assessment of the risks and opportunities presented by biodiversity to the investment portfolio

Appendix

Stakeholders interviewed

Organisation	Interviewee
CSIRO	Libby Pinkard
CDC Biodiversité	Antoine Vallier
Curtin University	Dr. Stephen van Leeuwen
Grantham Research Institute on Climate Change and the Environment	Nick Robins
Hermes EOS	Sonya Likhtman
Monash University	Graeme Samuel
Pollination Group	Geoff Summerhayes
The Wilderness Society Australia	Tim Beshara
WWF-Australia	Darren Grover

Frameworks for assessing and disclosing biodiversity impacts and dependencies

Assessment	
UN System of Environmental Economic Accounting	Framework to integrate economic and environmental data, including measurement of the value of ecosystem services.
IUCN Guidelines for Planning and Monitoring Corporate Biodiversity Performance	Defines an approach for companies to develop a biodiversity strategic plan, including metrics and targets to measure operational biodiversity performance.
Partnership for Biodiversity Accounting Financials	Partnership of financial institutions working to improve assessment and disclosure of biodiversity impacts associated with loans and investments.
Natural Capital Protocol	Framework to identify, measure and value an organisation's natural capital impacts and dependencies, and to assess associated risks and opportunities.
Biological Diversity Protocol*	Aims to enable organisations to measure their biodiversity impacts by providing a standardised approach to accounting for net ecosystem and species effects.
Natural Capital Finance Alliance*	Aims to improve financial services sector decision-making through assessment of nature impacts and dependencies, including through the ENCORE tool.
EU Align Project*	Aims to develop generally accepted methods, indicators and criteria for corporate biodiversity impact and dependency measurement.
Target-setting	
The Global Apex Goal for Nature	A number of organisations have supported the following goals: zero net loss of nature from 2020, net positive nature impacts by 2030 and full recovery of nature by 2050.
International Finance Corporation Performance Standard 6 (PS6)	The requirements, which apply to projects which are dependent on or may impact ecosystem services, aim to protect and conserve biodiversity, maintain ecosystem services, and promote the sustainable management of living natural resources.
UN Convention on Biological Diversity (CBD) Global Biodiversity Framework*	Includes 21 targets and 10 milestones to be reached by 2030 at a global level, including: conserving land and sea areas, reducing impact of invasive alien species, reducing use of pesticides, using ecosystem-based approaches to climate change, eliminating incentives harmful to biodiversity and increasing financial resources.
European Union (EU) Biodiversity Strategy for 2030 and EU taxonomy*	The EU Biodiversity Strategy provides a number of targets to be reached by 2030 (e.g. land degradation neutrality). The EU taxonomy, an EU-wide classification system for sustainable economic activities, will define the technical criteria for biodiversity.
Science-Based Targets for Nature*	Initial guidance has been released on setting science-based targets for nature, including a step-by-step guide for organisations to set such targets.

Disclosure	
Global Reporting Initiative (GRI)	*GRI 304: Biodiversity* includes four biodiversity reporting requirements: operational sites in or near areas of high biodiversity value; significant impacts on biodiversity; habitats protected or restored; and protected species in areas affected by operations.
Sustainability Accounting Standards Board (SASB) Standards	SASB Standards identify the ESG issues most relevant to the financial performance of a range of industries. The metrics relating to biodiversity impacts varies by industry (e.g. for coal operations, the biodiversity metrics relate environmental management, acid rock drainage and proximity to protected or endangered species).
Value Reporting Foundation	The Value Reporting Foundation is a non-profit organisation that provides guidance to companies with regard to planning and decision making, corporate reporting, and disclosure.
Carbon Disclosure Project (CDP) Forest Program	CDP's reporting system provides a framework for companies to measure and manage forest-related risks and opportunities, report on their progress, and commit to proactive forest and ecosystem restoration.
Taskforce on Nature-related Financial Disclosures (TNFD)*	Framework for organisations to manage and disclose nature-related risks, with the aim of supporting 'nature-positive outcomes', to be formally launched in 2023.
Finance for Biodiversity Pledge*	Under the Finance for Biodiversity Pledge, signatories commit to: collaborate and share knowledge on biodiversity action, engage with companies to improve biodiversity outcomes, assess biodiversity impacts, set and disclose biodiversity targets, and assess the contribution of financial activity on global biodiversity goals.
Climate Disclosure Standards Board (CDSB) Biodiversity Guidance*	CDSB has released draft guidance to assist organisations to disclose material biodiversity information in accordance with the existing CDSB reporting requirements.
Carbon Disclosure Project (CDP)/BNP Paribas biodiversity reporting metrics*	BNP Paribas and CDP have partnered to develop a common, globally relevant corporate biodiversity reporting framework and associated metrics intended to accelerate private sector action on nature.

Under development

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