



cardano

**Sustainable
Investment Policy**
Appendix E2:
Biodiversity Strategy

July 2023

About this document

Cardano is a privately owned, independent specialist in risk, pensions and sustainable solutions. We have developed a detailed sustainability policy explaining our views on how to invest towards a sustainable society. Our sustainability policies and strategies are organised as follows:

The Cardano Group Sustainability Policy is our overriding policy document, which includes our group-wide beliefs, targets, and an overview of the policy implementation. This policy is underpinned by three sets of documents that set out further details, which apply to our directly managed assets. These are:

1. The components of our sustainability policy, elaborating on our fundamental investment principles and our material sustainability drivers.
2. Our approach to stewardship, engagement and voting, as described in our Stewardship policy and Voting policy.
3. A more detailed explanation of our priority sustainability themes (we call these strategy documents) as explained in our strategy documents on climate change, biodiversity and water.

In this strategy document, we describe the Cardano biodiversity-related targets and actions. We describe the steps to be taken in the coming years to work towards our targets and how we aim to mitigate biodiversity-related risks.

The document sets out how we expect to make progress towards our targets. This includes how we engage with companies, vote at companies' AGMs, engage with policymakers, collaborate with our peers, participate in industry and NGO working groups and also exclude some investments where we think the real-world impact is too detrimental or the company or government is unable or unwilling to transition.

In the document, we also include the tools, the activities, and the measurements that help us to understand whether we are on track. It shows the complexities of the biodiversity challenge and the interrelationships with other sustainability themes we are working on. Our targets guide the steps to be taken. However, focus will be on real-world impact of our investment choices. We will resist pressure to modify portfolios to meet for instance headline portfolio-level decarbonisation targets at the expense of incentivising the real-world transition that is needed.

Executive summary: Cardano's biodiversity strategy

Biodiversity loss is an urgent global challenge. We are losing biodiversity at unprecedented rates, and this is threatening not only the future of many species but also several ecosystem services, including food production, availability of water resources, air quality, climate stability and ecosystem resilience, on which humans and economies depend. The impact of biodiversity loss will create serious risks for companies, directly through lower production and higher costs, and indirectly through supply chain disruption. Consequently, financial institutions are increasingly exposed to risk unless investee companies better mitigate their biodiversity-related risks.

Biodiversity targets

In line with the Kunming-Montreal Global Biodiversity Framework¹, we aim to reverse the trends of biodiversity loss and work towards a biodiversity-positive situation: restoring and regenerating ecosystems, rather than degrading and destroying. We will encourage investee companies to adopt solutions to restore ecosystems, as well as take initiatives to reduce pressures on the drivers of biodiversity loss to safe thresholds. To work towards our overall aims, we have four targets:

- No net deforestation by 2030
- Water neutral by 2030
- Net zero greenhouse gas emissions by 2050 at the latest
- Pollution and waste neutral by 2050²

Until we can reliably measure these targets, we monitor whether investee companies set targets and strategies to help reverse the trend of biodiversity loss.

Key levers for change

To contribute to the targets, our biodiversity strategy covers all drivers of biodiversity loss, focuses on real world impact and covers the reduction of pressures on the drivers of biodiversity loss, as well as the reduction of systemic and dependency risks.

Our biodiversity strategy has three key levers for change:

- 1. Reduce systemic risks and contribute to systemic solutions:**
 - a. Enhancing biodiversity through increased investment in restoration, nature-based solutions, regenerative agriculture, reforestation, or programmes increasing ecosystem resilience.
 - b. Encouraging or initiating collaborative action to create an environment where activities enhancing biodiversity are encouraged, while those that contribute to biodiversity loss are discouraged.
- 2. Reduce risks and create opportunities at investee companies through stewardship:**
 - a. Reducing direct negative impacts on biodiversity for relevant impact drivers. For example, encouraging companies to reduce using hazardous chemicals and instead use cleaner/more efficient technologies, cleaner inputs, sustainable land management practices, or follow certification scheme guidelines.
 - b. Reducing indirect negative impacts on biodiversity throughout their supply chains. For example, encouraging companies to consider biodiversity-related impacts of their suppliers and clients in procurement and supplier policies, their monitoring systems and their grievance and remedy systems.
 - c. Increasing business model resilience. For example, reducing dependency on key ecosystem services, preparing for expected future change through new investments and improved planning, or increasing knowledge about future change. Through stewardship, investee companies are encouraged to consider how dependencies on biodiversity will impact their business models, investment plans and strategies.

¹ Convention on Biological Diversity (2022). Kunming-Montreal Global Biodiversity Framework. Decision adopted by the Conference of the Parties to the Convention on Biological Diversity. CBD/COP/DEC/15/4 19 December 2022. <https://www.cbd.int/conferences/2021-2022/cop-15/documents>

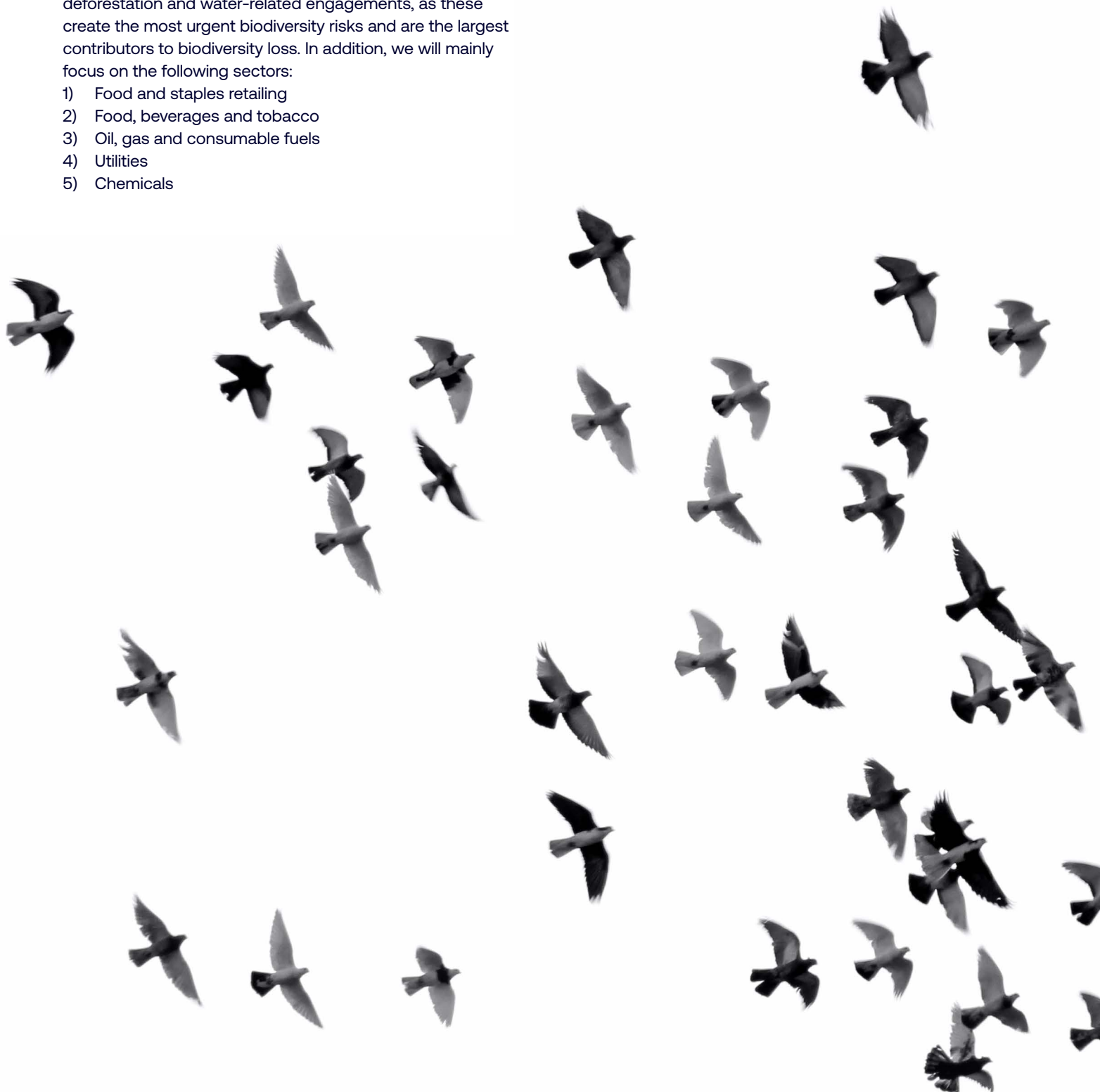
² Water, pollution and waste neutrality imply that a company's use of water or contribution to pollution or waste generation are reduced to levels that do not surpass the carrying capacity of the ecosystem: they do not harm biodiversity and ecosystem services, considering cumulative effects. See chapter 2.

3. Reduce biodiversity-related risks and create opportunities in Cardano's investment solutions:

- a. Divesting from companies that create high negative impacts or have insufficient risk management plans.
- b. Selecting companies with solutions that enhance biodiversity, improve resource efficiency, use nature-based solutions and reduce impact, for example.

Up to 2030, our emphasis is on climate change, deforestation and water-related engagements, as these create the most urgent biodiversity risks and are the largest contributors to biodiversity loss. In addition, we will mainly focus on the following sectors:

- 1) Food and staples retailing
- 2) Food, beverages and tobacco
- 3) Oil, gas and consumable fuels
- 4) Utilities
- 5) Chemicals



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1.

Introduction



Biodiversity underpins human welfare and economic prosperity. Yet it is disappearing at alarming rates, threatening not only many species, but also several ecosystem services, such as production of food, availability of water resources, air quality, climate stability, and ecosystem resilience, on which humans and economies depend.

We believe biodiversity loss is a major global challenge that impacts companies and financial stability. The impact of biodiversity loss creates serious risks for companies: directly, through lower production and higher costs or indirectly, through supply chain disruption. Consequently, financial institutions will be increasingly exposed to risks if biodiversity loss is not stopped, due to which reducing the drivers of biodiversity loss should urgently be high on their agenda.

Cardano's Sustainability Policy encourages companies to operate within planetary boundaries and respect the social foundations of well-being, below which no-one should fall. Biodiversity-related risks already are

an integral part of this Sustainability Policy. We have put in place due diligence procedures to assess sustainability risks and opportunities for our investments to account for the drivers contributing to biodiversity loss. In addition, we have initiated several successful engagement programmes with investee companies to encourage them to reduce their impacts on biodiversity loss.

This document elaborates on our biodiversity-related targets, the steps we are taking to reach these targets and how we aim to mitigate biodiversity-related risks. We have collated our biodiversity-related activities within a single document and describe how they are linked.

Biodiversity

Why is biodiversity loss a problem?

The Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) defines **biodiversity** as the total variability of life forms within a region, including terrestrial, marine, and other aquatic ecosystems, and the ecological complexes of which they are a part; this includes diversity within species, between species, and of ecosystems.

As the biotic (living) component of ecosystems, biodiversity interacts with abiotic components through flows of energy and materials, defining several **ecosystem functions**, such as biomass production and nutrient cycling. **Ecosystem services** are the goods and services that people obtain from healthy ecosystems functioning and are also known as ‘nature’s contributions to people’ (often classified into supporting, regulating, provisioning, or cultural services).

For many decades, scientists have warned that biodiversity levels are rapidly decreasing, raising serious sustainability concerns. Human actions have significantly increased the global rate of species extinction, while the extraction of living materials from nature has increased by over 200 per cent since 1970.³ Biodiversity loss alters the dynamics of ecosystems functioning, influencing their ability to provide essential ecosystem services.⁴ As biodiversity declines, the capacity of ecosystems to store water, prevent the spread of wildfires, or protect from floods and storms is impaired. Lower levels of biodiversity decrease the resilience of ecosystem functions (such as biomass production) in a nonlinear (accelerating) way, with unpredictable and potentially irreversible consequences. Crossing ecological tipping points may irreversibly alter entire ecosystems, turning once fertile areas into dry, infertile areas and tropical forests into savannah areas unsuitable for agriculture.

As economic processes are both directly and indirectly dependent on ecosystem services, biodiversity loss will inevitably worsen the resilience of our society and economic system. Decreasing resilience means it would be more difficult to withstand and successfully recover from shocks such as extreme weather events, droughts, harvest failures, plagues, and diseases, with potentially significant impacts on economic development and poverty in highly affected regions. Bending the curve of nature loss and species extinction is thus critical to preserve the capacity of the Earth system, and to ensure the provision of goods and services essential for human welfare and economic prosperity.

What causes biodiversity loss?

Financial institutions and companies often perceive biodiversity loss as an abstract concept, with a disarming effect. It is important they understand which forces contribute to biodiversity loss, and those that they can control.

Biodiversity loss is caused by the rapidly increasing use of natural resources in the economy. The direct drivers that cause the actual changes in natural capital, ecosystems functioning, and the supply of ecosystem services are:

- **Land and sea use change:** such as land conversion for cultivation, livestock raising, or plantations.
- **Resource exploitation:** such as fishing or farming at or beyond maximum sustainable levels.
- **Climate change:** such as greenhouse gas emissions or the physical impacts of climate change, including wildfires.
- **Pollution:** such as nitrogen deposition or air pollution.
- **Invasive species:** such as the spread of the American Oak in Europe or the Asian Tiger Mosquito.

Indirectly, biodiversity loss is being caused by several macro trends. The doubling in the global population since 1970 and 45 per cent increase in per capita consumption have resulted in a more than 200 per cent increase in the rate of natural resource extraction, an almost 900 per cent increase in global trade, and a more than 300 per cent increase in global gross domestic product (GDP) output.³

Direct drivers are under the control of companies – their mitigation is a necessary element for tackling the biodiversity crisis. The drivers that contribute most to biodiversity loss vary across sectors and industries. For instance: livestock raising contributes through land use change and deforestation for fodder production; fisheries companies may create pressure on biodiversity through overfishing; chemical companies are involved in soil, water or air pollution; and the oil and gas sector contributes to climate change through sales of fossil fuels and through methane emissions.

As goods from these sectors are inputs for companies downstream in the value chain, many downstream companies indirectly contribute to biodiversity loss. They can play a role in reducing biodiversity loss by considering drivers of biodiversity loss in their procurement processes.

3 Diaz, S. et al. (2019). Pervasive human-drive decline of life on Earth points to the need for transformative change. *Science*, Vol. 366, No. 6471. <https://doi.org/10.1126/science.aax3100>
4 Cardinale et al. (2012). Biodiversity loss and its impact on humanity. *Nature*, 486, pp. 59-67. <https://doi.org/10.1038/nature11448>

Why is biodiversity loss so important for business?

Biodiversity loss is one of the most potentially damaging environmental risks over the next five to ten years, with aggravating consequences on other outstanding risks.⁵ More than half of global GDP (\$44 trillion of economic value generation) is moderately or highly dependent on nature, so economic activities are heavily exposed to biodiversity decline.⁶ There are several types of biodiversity-related risks:

- **Physical risks** are the most visible, as biodiversity loss may lead to: lower or more volatile food or natural resources production; lower availability of key natural resources such as clean water or land; and higher costs if key regulating services such as pollination, pest control, soil fertility processes and water or air purification are lost. These risks may be **acute**, as a drought may destroy harvests, and **chronic**. For example, areas may become unsuitable for electricity generation due to lower cooling water availability, or climate change, leading to desertification of once fertile agricultural land.
- **Reputational risks and litigation risks** are rising as companies and financial institutions are increasingly held accountable for their direct or indirect contribution to biodiversity loss through their activities or investments.
- **Transition risks** may impact large parts of the economy due to changing consumer preferences, market demand, technological developments, and stricter regulation. Companies that do not acknowledge these transitions may lose market position and eventually risk being stranded.
- **Systemic risks** caused by biodiversity loss are more difficult to manage for individual companies. Ecosystem collapse once we cross ecological tipping points, or financial instability caused by large and unforeseen shocks in key segments of supply chains, may lead to cascading impacts on multiple sectors and financial institutions. Financial institutions can play their role in reducing systemic risks by directing capital towards companies or projects that provide solutions for reversing biodiversity loss and regeneration.

At the company level, biodiversity-related risks could materialise through: the disruption of operations or activities along the value chain; raw materials price volatility; stranded assets; the adjustment or relocation of activities; or capital destruction due to physical risks. These events could lead to credit, market, liquidity or business operations risks, ultimately impacting the financial sector. ↗

However, mitigating biodiversity loss may also create opportunities for companies.⁷ The WEF values business opportunities from nature protection at \$10 trillion.⁵ Companies may develop new products, services and business models, which could result in lower costs of capital and operational efficiencies, and even returns on investments that reverse the decline of biodiversity loss. Furthermore, growing consumer demand for sustainability can help with maintaining or enhancing customer loyalty, and lead to sales and revenue growth (such as sustainable fashion). Sustainability-oriented value propositions can also enhance talent acquisition and retention.



More than half of global GDP (\$44 trillion of economic value generation) is moderately or highly dependent on nature.

Relevant literature

Over the past decade, much has been written about the unprecedented loss of global biodiversity and the subsequent risks for economies, business, and the financial sector. Some of the most influential publications are listed below.

The severity of biodiversity loss

- *IPBES Global Assessment Report (2019)* – a comprehensive assessment on the status and trends of biodiversity and ecosystem services. Full report available at: <https://www.ipbes.net/>
- *WWF Living Planet Report (2022)* – a publication on the trends in global biodiversity released every two years: <https://www.wwf.org.uk/our-reports/living-planet-report-2022>

Risks of biodiversity loss for the financial sector

- *Indebted to Nature (2020)* – a joint DNB-PBL study on Dutch financial institutions' exposure to risks from biodiversity loss: <https://www.dnb.nl/en/general-news/dnbulletin-2020/indebted-to-nature/> ↓

5 WEF (2022). World Economic Forum Global Risks Report 2022.

6 WEF (2020). World Economic Forum Global Risks Report 2020.

7 See e.g. BCG (2021). The Biodiversity Crisis is a Business Crisis. <https://www.bcg.com/publications/2021/biodiversity-loss-business-implications-responses>

- A “*Silent Spring*” for the Financial System? (2021)
Exploring Biodiversity-Related Financial Risks in France:
<https://publications.banque-france.fr/en/silent-spring-financial-system-exploring-biodiversity-related-financial-risks-france>
- *Central banking and supervision in the biosphere: An agenda for action on biodiversity loss, financial risk and system stability* (2022) – the final report of the NGFS Study Group on Biodiversity and Financial Stability:
https://www.ngfs.net/sites/default/files/medias/documents/central_banking_and_supervision_in_the_biosphere.pdf

Detailed discussions of risks for financial companies

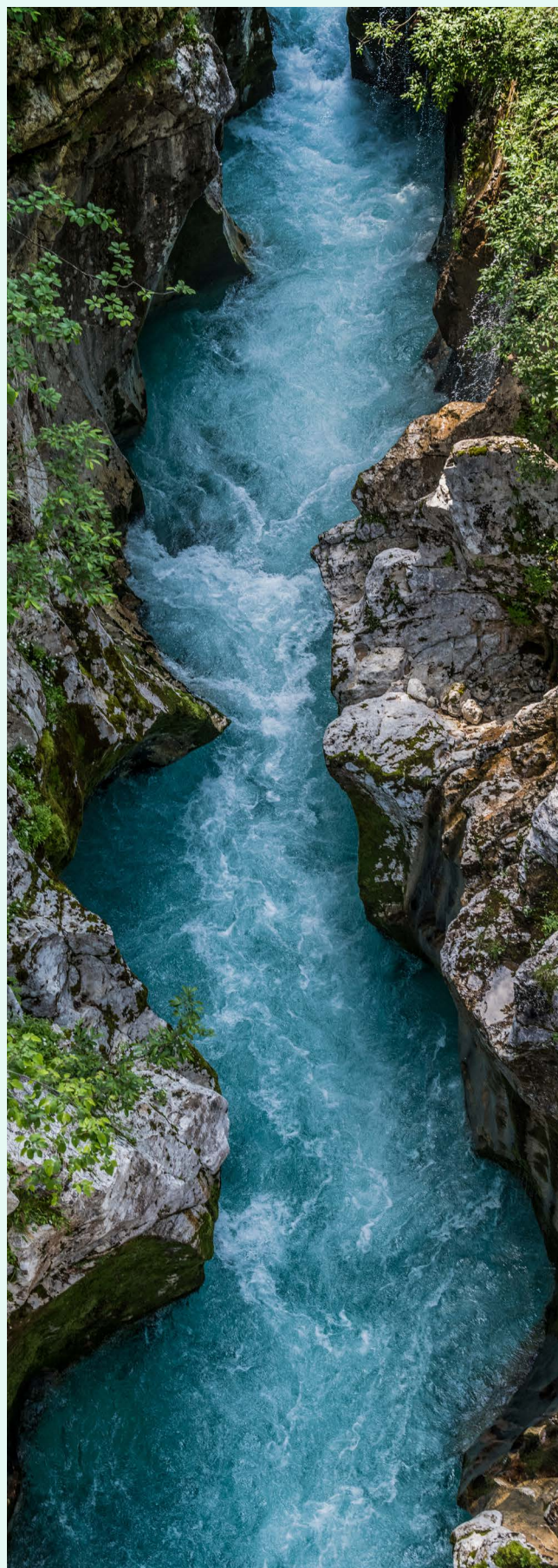
- Finance for Biodiversity Foundation - a series of publications to build a common understanding of biodiversity-related strategies and practices within the financial sector:
<https://www.financeforbiodiversity.org/publications/>
- The UNEP Finance Initiative provides extensive technical research and guidance to bring nature into financial decision-making: <https://www.unepfi.org/category/publications/?ca%5B0%5D=19>

Developments in impact measurement

- The Platform for Biodiversity Accounting Financials (PBAF) developed a standard for financial institutions to measure their impact on biodiversity:
<https://pbafglobal.com/standard#standard>
- The Finance for Biodiversity Foundation also published a comprehensive guide on biodiversity measurement approaches: <https://www.financeforbiodiversity.org/publications/guide-on-biodiversity-measurement-approaches/>

Frameworks for companies and financial institutions

- The Taskforce on Nature-related Disclosures (TNFD) will release in September 2023 the final version of its risk management and disclosure framework.
<https://framework.tnfd.global/>
- The Science-based Targets Network (SBTN) developed an initial guidance for business to get started on setting nature science-based targets (SBTs):
<https://sciencebasedtargetsnetwork.org/>



2.

Biodiversity targets



Cardano's biodiversity targets are in line with internationally agreed biodiversity targets, as described in the Kunming-Montreal Global Biodiversity Framework (GBF) (see page 14). Based on the GBF, we follow a layered approach: we aim to **reverse the trends of biodiversity loss** and work towards a **biodiversity-positive** situation, where ecosystems are being restored and regenerating rather than degraded. We will encourage investee companies to adopt solutions to restore ecosystems, as well as take initiatives to reduce pressures on the drivers of biodiversity loss to safe thresholds. This should be done in a balanced way, acknowledging transition timescales and costs of change.

Even though methods to measure the progress of our overall aim are still evolving (see page 15), it is important to be clear about the aspirations we are working towards to reverse the trend of biodiversity loss and how we plan to do this. To further detail our aspirations and as different timeframes apply to different drivers or sectors, we define four targets that relate to the four drivers of biodiversity loss and that are a means to work towards our overall aim:

- Zero net deforestation by 2030
- Water neutral by 2030
- Net zero greenhouse gas emissions by 2050 at the latest
- Pollution and waste neutral by 2050

Water, pollution and waste neutrality imply that a company's use of water or contribution to pollution or waste generation are reduced to levels that do not surpass the carrying capacity of the ecosystem: they do not harm biodiversity and ecosystem services, considering cumulative effects.⁸ Our four targets cover the major drivers of biodiversity loss, but not all. As yet, there is no workable set of targets that covers all possible ways that companies can reduce pressures on the drivers of biodiversity loss. In addition, we can monitor greenhouse gas emissions, but measurement methods for our three remaining targets are under development.

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Cardano's biodiversity targets are in line with internationally agreed biodiversity targets.

Therefore, in line with target 15 of the GBF,⁹ we ask investee companies to set targets and formulate strategies to work towards our targets and reverse the trends of biodiversity loss, based on guidelines from global initiatives such as the TNFD and STBN. We expect investee companies to formulate actions that use elements from the TNFD LEAP process or the SBTN AR3T action framework, to:

- Avoid and reduce pressures on the material drivers of biodiversity loss.
- Restore and regenerate nature so ecosystems can recover.
- Transform underlying systems to address the drivers of biodiversity loss.

To work towards the four targets, we need to increase the percentage of investee companies from material sectors that set targets and strategies that contribute to reversing the trend of biodiversity loss. In 2023, this is around 12% of our directly invested funds. We will monitor whether this percentage increases such that we work towards reaching our targets. We will use our influence through company engagement, voting, collaboration with other investors, policy engagement, and if necessary, divestment. See Chapter 4 for more detail on how we monitor progress on our targets.

Investee company strategies do not necessarily have to focus on biodiversity, if they address the material drivers of biodiversity loss to which they contribute. For example, this could include strategies focusing on own operations as well as strategies impacting pressures upstream or downstream in the supply chains. We consider to what extent investee companies follow guidelines from relevant certification schemes, industry best practices or sectoral standards. We also consider which investee companies report their impacts and dependencies, according to upcoming accounting standards (such as TNFD, SBTN, ISSB or other standard setting bodies).

8 The pollution and waste neutrality target aligns with the EU Circular Economy Action Plan to promote circular economy processes, prevent waste and keep resources in the economy as long as possible. This applies not only to pollution or waste generation during the production process, but also during the entire life cycle of products. Some products contain hazardous or forever chemicals that persist in nature once products are disposed. These chemicals should be phased out, even if they don't cause problems during the production process.

9 Target 15 of the GBF calls upon companies and financial institutions to monitor, assess and disclose their risks, dependencies and impacts on biodiversity.
<https://www.cbd.int/article/cop15-cbd-press-release-final-19dec2022>



Table 1:

Cardano's biodiversity targets

Overall aim

Reverse the trend of biodiversity loss and work towards a biodiversity-positive situation

Targets related to the drivers of biodiversity loss

Zero net deforestation by 2030

Water neutral by 2030

Net zero greenhouse gas emissions by 2050 at the latest

Pollution and waste neutral by 2050

Operational approach

Monitor the increase of the percentage of investee companies that has formulated targets and strategies to reverse the trend of biodiversity loss



Setting biodiversity targets

The Kunming-Montreal Global Biodiversity Framework

The Kunming-Montreal Global Biodiversity Framework (GBF) was the final output of the COP15 of the Convention on Biological Diversity (CBD) in Montreal, December 2022. It gives internationally agreed goals and targets to halt biodiversity loss and allow for the recovery of biodiversity by 2050, while respecting the rights of indigenous people and local communities (Convention on Biological Diversity, 2022). The GBF is articulated in long-term, outcome-oriented goals and short-term, action-oriented targets.

Up to 2030, the key targets focus on restoring at least 30 per cent of degraded ecosystems, protecting 30 per cent of the global high biodiversity areas, and redirecting capital to close the biodiversity finance gap that is necessary to implement the framework. The diversity of the targets shows the complexity of this endeavour. Action is needed for all drivers of biodiversity loss and differs in every sector. Reducing negative impact is insufficient to initiate restoration and the sustainable use of ecosystem services. We need a broad transition that directly or indirectly impacts many companies.

The GBF targets

Risk assessment and disclosure: GBF target 15 has the largest implications for businesses. It urges governments to act and enable businesses to monitor, assess and disclose their biodiversity-related risks, dependencies and impacts. It encourages companies to set measures to progressively reduce negative impacts on biodiversity, increase positive impacts and promote actions to ensure sustainable patterns of production. Target 14 adds the importance of integrating biodiversity into company environmental impact assessments and wider accounting and planning practices. Target 16 encourages companies to actively promote sustainable consumption patterns, halve global food waste and reduce overconsumption and waste generation.

Land and sea use change and resource exploitation:

To conserve and sustainably manage at least 30 per cent of terrestrial, inland water, coastal, and marine areas by 2030 (target 3), companies directly or indirectly involved in land and sea use change are encouraged to implement participatory and integrated biodiversity inclusive spatial planning, and introduce management processes to contribute bringing the loss of areas of high biodiversity importance and ecological integrity close to zero by 2030 (target 1). In addition, companies active in agriculture, aquaculture, fishery and forestry are urged to increase their



resilience, long-term efficiency and productivity through a substantial increase in biodiversity-friendly practices (target 10) or nature-based solutions (target 11).

Sustainable urbanisation processes should increase the area, quality, connectivity, and access of green and blue spaces in urban and densely populated areas with the help of biodiversity-inclusive urban planning (target 12).

Climate change: It is important that climate change mitigation, adaptation and disaster risk reduction actions are in synergy with their biodiversity actions, for instance by implementing nature-based solutions or ecosystem-based approaches (target 8).

Pollution: Companies are encouraged to identify safe threshold levels for pollution from all sources and set science-based targets for reducing their cumulative impact on biodiversity and ecosystem functions. Priority sources of pollution include excess nutrients loss, pesticides, highly hazardous chemicals and plastic (target 7).

Invasive species: Companies should adopt management systems that mitigate, reduce or eliminate the impacts of invasive alien species on biodiversity (target 6). Where applicable, companies should identify alien species' introduction pathways along their value chain and reduce the rates of introduction and establishment, while controlling invasive alien species in priority areas.

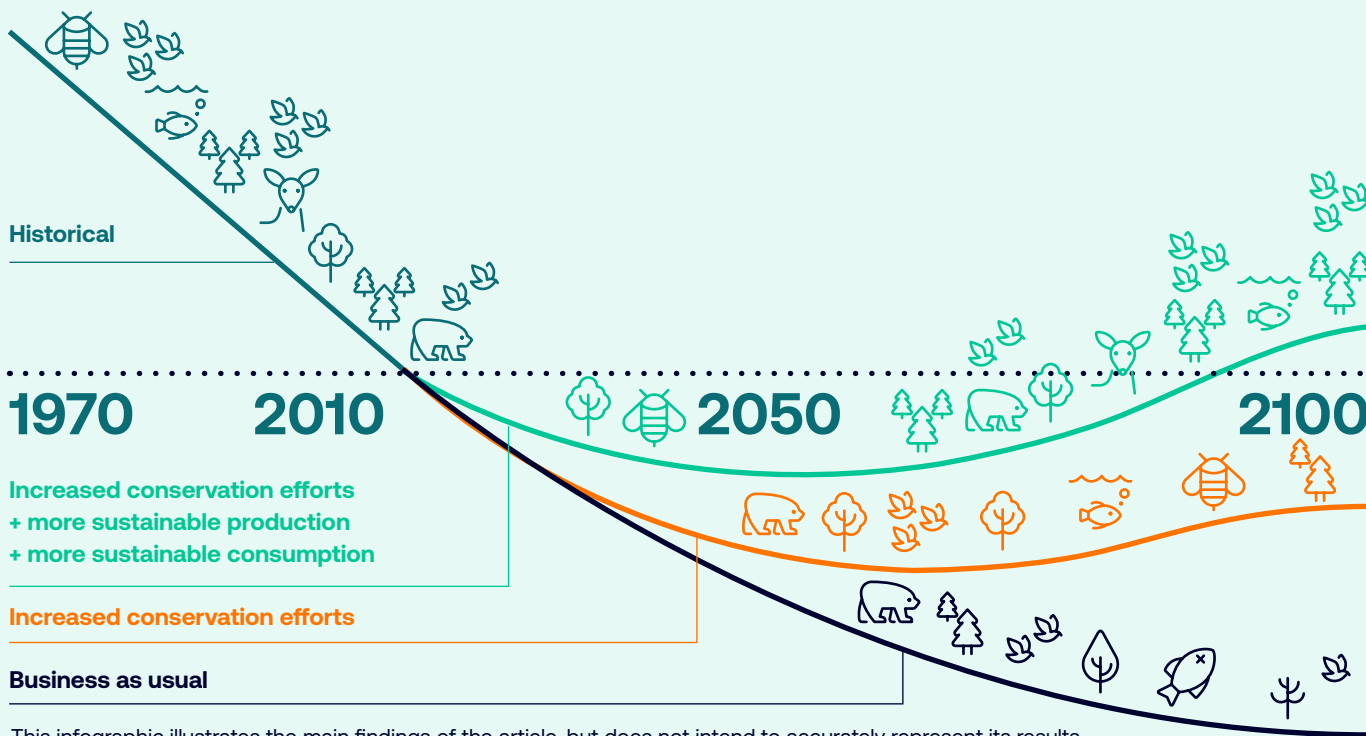
Bending the curve of biodiversity loss¹⁰

Minimising impact drivers is imperative to stop nature loss and maximise overall gains, which otherwise would likely be eroded. To reverse the trend of biodiversity loss and work towards a biodiversity-positive situation, we should first bring direct drivers of nature's decline below safe thresholds. These should be the focus of any biodiversity strategy. The outcomes of mitigating drivers will be:

- 1) Decelerate biodiversity extinction and biosphere deterioration rates
- 2) Prevent further nature decline
- 3) Allow for the recovery of the biosphere

The second step is to initiate ecosystem recovery to avoid crossing the earth system boundary for biosphere deterioration and to achieve a level well below the safe threshold.

The third step focuses on net positive gains in ecological integrity with the achievement of a safe buffer above the earth system boundary for biosphere deterioration.



Setting a biodiversity target

Setting a biodiversity target with a 2050 deadline would not do justice to the urgency needed to reverse biodiversity loss. The expected magnitude of social, economic and financial impacts if biodiversity loss continues at its current speed requires immediate action, and does not allow for further delays from governments, companies or financial institutions.

Reaching a net positive state of nature by 2030 and recovery by 2050 are aims worth striving for, but are timelines that are difficult to reach. This would imply that by 2030 all drivers of biodiversity loss have improved to levels sufficiently low to halt biodiversity loss.

For some drivers of biodiversity loss, this timeline may be feasible, while it will be significantly harder for other drivers. More deforestation is not necessary to feed the world population and plastics do not have to end in the ocean. In most countries, the regulation exists, but compliance and monitoring are the bottlenecks.

For other drivers of biodiversity loss, it will take more time to realise a transition. Net-zero climate targets are set for 2050, not only because the carbon budget to prevent global warming to exceed 1.5°C has not yet been depleted, but also because we still require the technological innovation that allows us to make the necessary transition.

In addition, material re-use opportunities have significantly improved, but require further innovation and systemic changes to allow for a circular economy without pollution. Therefore, our biodiversity aim consists of impact-focused, driver-specific targets, each with a different timeline.

Measuring biodiversity

Measuring biodiversity is a challenging task. There is not a single indicator that unambiguously shows the state of species diversity and species abundance all over the world. Commonly used indicators are the IUCN Red List of Threatened Species or the WWF Living Planet Index.¹¹ There are many methods under development that allow companies and financial institutions to measure their impact on biodiversity.¹² Most methods are model-based, but there are also observation-based approaches or geo-spatial methods, which map whether company's production locations are degrading or not.

Despite these developments, it remains difficult to monitor the extent to which individual companies' biodiversity strategies contribute to reversing biodiversity loss. There is seldom a one-to-one relationship between a company's biodiversity strategies and its impacts on biodiversity. If a company is alone in reducing its pressures in a certain area, biodiversity levels in that area may still not recover if others do not reduce their pressures. In addition, actions reducing pressures often take time to materialise and are, therefore, not immediately reflected in biodiversity data from observation-based methods. Model-based biodiversity measures may be better capable of showing the potential impacts of individual strategies, but this is still in early stages of development.

11 See <https://www.iucnredlist.org/> and <https://www.livingplanetindex.org/>.

12 See 'Guide on biodiversity measurement approaches available through the Finance for Biodiversity Foundation: Publications Archive - Finance for Biodiversity Pledge, or guidance given by the Partnership for Biodiversity Accounting Financials on www.pba4global.com.

3.

How to reach the biodiversity targets



3.1 Key levers for change to reverse the trend of biodiversity loss

To reach our biodiversity targets, we have three base premises:

- Our action covers all drivers of biodiversity loss.
- We can only reduce risks by focusing on real-world impact.
- Our focus is not only on reducing the drivers of biodiversity loss by investee companies, but also on encouraging systemic change and reducing dependency risks.

Cardano’s biodiversity strategy prioritises three levers for change:

1. Reduce systemic risks and contribute to systemic solutions

- a. Enhancing biodiversity by increasing investment in restoration, nature-based solutions, regenerative agriculture, reforestation, or programmes increasing ecosystem resilience.
- b. Encouraging or initiating collaborative action between policy makers, businesses, financial institutions, NGOs and consumer organisations to create an environment where activities enhancing biodiversity are encouraged and those contributing to biodiversity loss are discouraged.

2. Reduce risks and create opportunities at investee companies through stewardship

- a. Reducing direct negative impacts on biodiversity for relevant impact drivers. For example, encouraging investee companies to reduce using hazardous chemicals and instead use cleaner or more efficient technologies, cleaner inputs, sustainable land management practices, or follow certification scheme guidelines.

- b. Reducing indirect negative impacts on biodiversity throughout their supply chains. For example, encouraging investee companies to consider biodiversity-related impacts of their suppliers and clients in procurement and supplier policies, their monitoring systems and their grievance and remedy systems. This includes monitoring systems for detecting and proactively managing deforestation incidents caused by commodity production such as palm, soy, timber, cattle and others.
- c. Increasing business model resilience. For example, reducing dependency on key ecosystem services, preparing for expected future change through new investments, and improved planning or increasing knowledge about future change. Through stewardship, investee companies are encouraged to consider how dependencies on biodiversity will impact their business models, investment plans and strategies.

3. Reduce biodiversity risks and create opportunities in Cardano investment solutions

- a. Divesting from companies that are unwilling or incapable of making the transition and that create high negative impacts or have insufficient risk management plans. If engagement does not result in sufficient improvement or if investee companies are unwilling or unable to account for the risks they are exposed to or the impacts they create, divestment may follow. Exclusion may be based on low scores for each of drivers of biodiversity loss.
- b. Selecting investee companies that provide solutions for enhancing biodiversity, improving resource efficiency, using nature-based solutions or reducing impact. As regulations are expected to become stricter and consumer demand is expected to change, investee companies providing such solutions may flourish.

Table 2:

Key levers in Cardano’s biodiversity strategy



Reduce systemic risk

Invest in solutions
Engage policy makers to correct market failures and externalities

Reduce risk and create opportunities at investee companies

Engage to reduce direct negative impacts
Engage to reduce indirect negative impacts
Engage to increase business model resilience

Reduce portfolio risk and take opportunities

Positive selection
Divestment

3.2 Our strategic priorities

To drive change, our biodiversity strategy focuses on the following activities:

3.2.1 Reduce systemic risks

We are taking two actions:

1) **We aim to invest in new impact investment solutions or invest in impact bonds focusing on positive biodiversity change.** Such solutions may include project finance, private debt or equity or blended finance, as the number of listed companies that positively contribute to biodiversity is still limited. We will consider activities positively contributing to biodiversity such as ecosystem restoration, nature-based solutions, regenerative agriculture, reforestation or programmes increasing resilience of ecosystems, while properly considering the impacts of such activities on local and indigenous communities. As demand for financing ecosystem restoration is expected to grow with the increased call for reducing biodiversity loss, such investment solutions may provide promising opportunities.

2) **We aim to encourage systemic change through engagement, by:**

- **Engaging policy makers to implement policies that encourage companies to consider the externalities from production.**

Biodiversity loss is for most companies an externality – an unintended side-effect of their activities, for which they do not compensate those impacted. Through policy engagement with national or multilateral policy makers, we will prompt authorities to initiate or improve regulations to change the incentive structure of companies to reduce their impact, either directly or throughout their supply chain. This can be on extended producer responsibility or on the ban of the import of commodities contributing to deforestation, for example.

More is needed from policy makers, such as improved compliance monitoring to existing regulations, ending subsidies to harmful activities or changing trade regulations so sustainable production methods are supported and companies better consider local communities, indigenous people human rights and poverty.

Engagement with policy makers may also drive authorities to initiate new financial policy instruments that foster sustainable production methods and discourage excessive resource use and harmful emissions. These actions could create a level playing field and make sustainable investment more profitable, as they remove barriers that put sustainable investments at a disadvantage.

- **Engaging policy makers and companies on nudging consumers to change their consumption behaviour.**

Biodiversity loss is partly a consequence of consumption habits. Bending the curve of biodiversity loss will be difficult without reducing overconsumption of food, clothing and customer use of products. We also need to change consumption patterns, shifting from: animal-based to alternative protein sources; fossil-based energy to renewable energy; fossil-based products to biobased products; single use to circular products and production; and ownership to rental of products.

In our stewardship policies, we plan to encourage behavioural changes for example through: engagement with retailers to put sustainable or healthy foods in more prominent positioning; with fashion brands to improve the lifetime of their products; with national policy makers or the European Commission to allow for VAT diversification between sustainable and non-sustainable products; and by increasing investments in sustainable products or in renewable or circular materials or methods.

Encouraging companies to invest more in alternative products provides new and promising investment opportunities, as demand for these products is expected to grow exponentially over the coming decades. We will support initiatives from within the financial sector or NGOs focusing on policy engagements that help to create a level playing field.



Bending the curve of biodiversity loss will be difficult without reducing overconsumption

3.2.2 Reduce risks and exploit opportunities at investee companies through stewardship

We aim to encourage investee companies to reduce their pressure on the drivers of biodiversity and prepare for changing ecosystem services availability. Given the reputational, transition and physical risks related to biodiversity loss, we expect investee companies that consider their negative impacts and dependencies in depth to be better prepared for the future.

Reduce direct impacts

To **reduce direct impacts**, we will discuss with investee companies how their strategies and operations put pressure on biodiversity. The priority sectors for such engagements are sectors with the largest direct impacts on any biodiversity loss driver. Depending on the sector or driver of biodiversity loss, stewardship activities relate to progressing the following (non-exhaustive) list of necessary changes:

- **Climate change:** reduce emissions of greenhouse gasses such as CO₂, methane and other greenhouse gasses, improve energy efficiency, or increase capture and storage of greenhouse gases through nature-based or technological solutions. The highest emissions originate from sectors such as utilities, oil and gas, chemicals, construction materials, airlines, metals and mining companies, automobile manufacturers and transport companies. See Cardano's climate strategy for a priority list.¹³
- **Land and sea use change:** halt deforestation, reduce land use intensity, prevent excessive use of harmful (crop protection) chemicals, better plan urbanisation, or reduce fragmentation from infrastructure development. Sectors with the highest impact are soft commodities and food producers (especially producers of palm oil, soy and cattle products), paper and forest products, metals and mining, oil and gas, construction materials, utilities and real estate sectors.
- **Resource extraction:** halt overharvesting of fish stocks and other renewable natural resources, reduce water overexploitation in water-scarce areas, or adapt mining activities to the carrying capacity of the environment. Highest impacts on biodiversity are caused by food, metals and mining, oil and gas and paper and forest products sectors.
- **Pollution:** improve waste management, reduce or eliminate use of hazardous chemicals, reduce waste in production processes and consumption, reduce plastic

pollution in the environment, or prevent emissions to air, water and soil beyond carrying capacities of the environment. A broad set of investee companies can contribute to pollution, as many produce waste or use chemicals that impact biodiversity if not well managed or if emitted to air, water or soil.

- **Invasive species:** prevent non-native species to migrate to other ecosystems via tourism, transport and trade.

Reduce indirect impacts

To **reduce the indirect impacts** caused by investee companies through their supply chains, we will discuss with investee companies the impacts of their procurement and business relations, and the reputational, liability and transition risks to which they are exposed. Through stewardship, we will encourage investee companies to:

- **Improve procurement policies and monitoring systems** so investee companies stimulate their upstream suppliers to make the necessary changes.
- **Improve grievance and remedy policies.** Investee companies should have policies to deal with supplier grievances for which they are accountable, according to international standards such as the OECD Guidelines on Multinational Enterprises.¹⁴ Most grievance cases deal with natural resources exploration, mining, production or pollution incidences that negatively impact human rights, local communities or the environment. This may extend to contributions to climate change.
- **Reduce downstream impacts** caused by customer use of products. As an example, some crop protection measures have been found only to impact biodiversity negatively if they are not used properly – at high dosage levels or in wrong weather and soil conditions. Producers of such chemicals can prevent biodiversity loss through proper customer training, labelling and information provision. This also relates to reducing scope 3 greenhouse gas emissions, use of drinking water or waste generation.

Supply chain responsibility is gaining in importance for all companies. Given EU regulation on deforestation and extended producer responsibility,¹⁵ this is especially pressing for the food and staples retailing, food and beverage, and consumer durables and apparel sectors, as they are mostly dependent on upstream soft commodity and agricultural producers. Yet it also applies to sectors using raw materials and metals for energy equipment, semiconductors, technology hardware and automobiles.

13 www.actiam.com/490798/siteassets/4_verantwoord/documenten/en/actiam-climate-target-strategy.pdf

14 <https://www.oecd.org/corporate/mne/>

15 See https://environment.ec.europa.eu/topics/forests/deforestation/regulation-deforestation-free-products_en and https://commission.europa.eu/business-economy-euro/doing-business-eu/corporate-sustainability-due-diligence_en

Increase business model resilience

Investee companies need to recognise where biodiversity-related risks are likely to increase in their business models, and how to mitigate these risks. This focus on business model resilience will not necessarily lead to a lower impact on biodiversity, but will decrease dependencies on biodiversity and ecosystem services. For example:

- Volatility of harvests due to reduced pollination, declining soil fertility and increased water scarcity, impacting all parties in the agricultural supply chain.
- Increased water scarcity, leading to disruption of water-dependent production processes, and leading to reduced availability of cooling water, impacting most industrial sectors and utilities.
- Increased incidences of extreme weather events, impacting the real estate sector, insurance companies, the transport sector and production facilities in vulnerable areas.
- Reduced natural flood protection due to land-use change, urbanisation and climate change, impacting the resilience of infrastructure, networks and data centres.

This especially applies to companies that are directly or indirectly dependent on ecosystem services, such as food and beverages, food and staples retailing, and paper and forest products sectors. It also applies to companies dependent on water resources such as the utilities, semiconductor, capital goods and technology hardware sectors, or on erosion control and extreme weather regulation, such as real estate and transport and logistics sectors.

Focus areas up to 2030

We will use shareholder resolutions as a form of influence to encourage or if necessary, require companies to reduce risks and oppose resolutions that increase risks of biodiversity loss. We will also continue to use collaborative engagement programmes that focus on biodiversity or its drivers to motivate companies to step up their efforts. Up to 2030, we will mainly focus on climate change, deforestation and water-related engagements to reduce impacts and improve investee company resilience, as we consider these the most pressing risks and the most important causes of biodiversity loss. Due to interdependencies between biodiversity loss drivers, this approach will indirectly cover other drivers.

In addition, we will emphasise sectors most relevant for our portfolios in terms of negative contribution to biodiversity:

- 1) Food and staples retailing
- 2) Food, beverages and tobacco
- 3) Oil, gas and consumable fuels
- 4) Utilities
- 5) Chemicals

3.2.3 Reduce risks and exploit opportunities in our investment solutions

The third lever of our biodiversity strategy is already mostly part of Cardano's Sustainability Framework and our climate and water strategies,¹⁶ in which we describe our criteria to identify investee companies that are 'frontrunners', and also those that are lagging behind in the transition, which create high biodiversity-related risks.

We aim to reduce biodiversity-related portfolio risk through **positive selection** of frontrunners and **divestment** from those incapable or unwilling to make the transition. As we describe in our Sustainability Policy,¹⁷ divesting from notorious unsustainable companies, including those that cause significant biodiversity loss, can decrease the cost of capital for more sustainable businesses, giving them a competitive advantage. Companies providing solutions for managing biodiversity loss or even enhancing biodiversity are taking advantage of this opportunity, and we expected them to demonstrate higher growth due to the increased materiality of biodiversity. Our forward-looking approach considers not only past behaviour, but also plans, targets and strategies that investee companies are using to make the transition according to the required pathways.

- **Climate change:** We expect investee companies to set net zero targets and design strategies to make the transition to a low-carbon society that complies with global temperature rise that does not exceed 1.5°C. We also expect clarity about investee companies pathways for coal exclusions, reductions in fossil fuel exposure, and investments in low-carbon solutions, as well as plans related to carbon capture and storage, and the use of carbon intensive materials or methods. (See Cardano's climate strategy for a detailed description of expectations for each sector). Investee companies exposed to climate change that do not comply with these expectations may be excluded from Cardano's sustainable funds.

¹⁶ See <https://www.actiam.com/en/sustainable-investments/> for these documents.

¹⁷ See https://www.actiam.com/4ae94e/siteassets/4_verantwoord/documenten/en/a-actiam-sustainability-policy.pdf

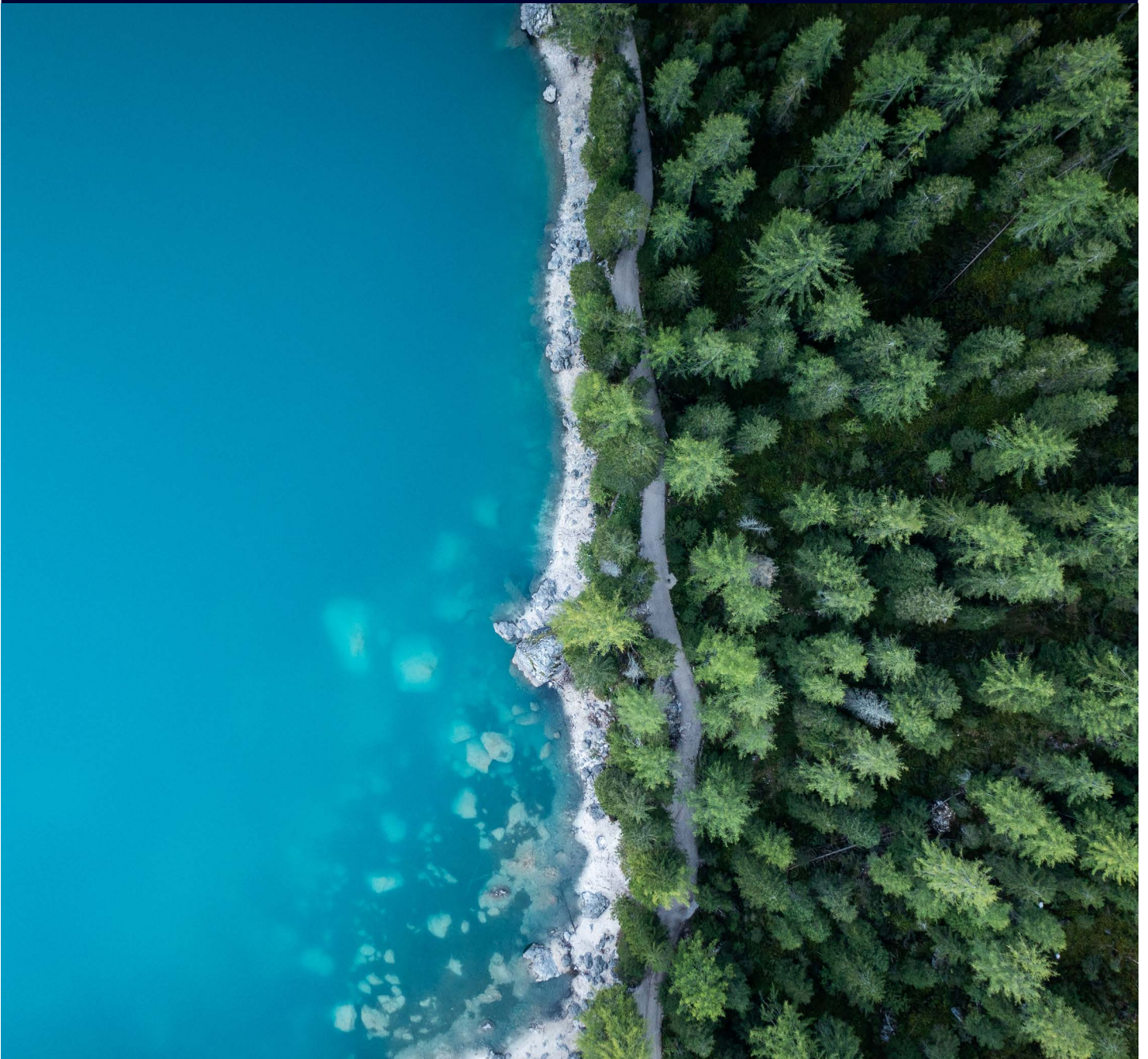
- **Land and sea use change:** Land and sea use-related impacts that may qualify for divestment relate to direct impacts caused (among other things) by deforestation, intensive agriculture, production or use of (plant protection) chemicals causing soil and water pollution and harmful fishing methods. Excluded activities may also include construction, real estate or infrastructure projects that cause significant impacts or that present risks which are insufficiently mitigated. Finally, it may also relate to indirect impacts, such as food processing companies or food retailers sourcing from suppliers that contribute significantly to biodiversity loss (especially related to palm oil, soy and cattle products). Investee companies are expected to formulate strategies, set time-bounded targets and prove how they are reducing their impacts, for instance by following guidelines from relevant certification systems such as RSPO, RTRS, FSC and MSC.
- **Resource extraction:** To evaluate companies involved in resource extraction, we make a distinction between renewable and non-renewable resources. Investee companies extracting renewable resources, such as water, timber or fish, are evaluated on how they operate within the carrying capacity of the ecosystem and whether they assure that their resource use does not negatively impact stocks and possibilities for other companies and local populations. For non-renewable resources, especially for mining activities, we evaluate whether investee companies properly consider local populations, indigenous people, human rights, biodiversity hotspots, potential negative impacts of their operations, the use of sustainable mining technologies and remediation activities – once operations close. Investee companies need to set targets and formulate strategies, proving their approach to limit or mitigate negative biodiversity impacts is in line with industry best practice.
- **Pollution:** To assess how companies deal with pollution, we consider direct contributions to air, water and soil pollution in production processes, such as from chemical or oil and gas companies, and indirect contribution to pollution by users of the products. Plastics packaging producers, food and beverage producers and consumer product producers using packaging materials are increasingly held responsible for plastic pollution and low recycling rates. In addition to material substitution and application of circular methods, investee companies should demonstrate reduced packaging use. Agricultural chemicals producers are increasingly held responsible for their contribution to the loss of pollinators, water pollution and adverse health impacts. Finally, producers and users of chemicals of concern with known negative impacts on biodiversity, such as PFAS or related persistent chemicals, need to set targets, commit to phase-out dates, set time paths for reaching these targets, and prove they are taking action to get there.
- **Invasive species:** For this driver, no divestment criteria have been formulated to date. We monitor potential risks for companies in the tourism, transport and shipping sector, related to how they manage spread of invasive species and assess invasive species related controversies individually.

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Investee companies need to set targets and formulate strategies.



4.

Monitoring and reporting



It is important to monitor how our efforts to reverse the trend of biodiversity loss are paying off. However, biodiversity footprinting is under development, as are methods that monitor if water and waste footprints are within carrying capacity, and if net-deforestation has come to a halt.¹⁸ Once these methods are sufficiently mature, we will adopt them to monitor our progress in our overall aim and our targets that relate to the drivers of biodiversity loss (see chapter 2). Until then, we will focus on monitoring the exposure of our investee companies to biodiversity loss, and their targets and strategies to reverse the trend of biodiversity loss in our investment solutions.¹⁹ We prompt investee companies to report on their impacts, targets and strategies using any of the leading assessment and disclosure frameworks. Guidance on reporting is given by the 'GRI standard 304' on biodiversity, or will be in the TNFD guidelines published in September 2023. Over the coming years, SBTN and ISSB will also provide more guidance on biodiversity indicators and assessment frameworks.

We monitor our exposure to investee companies with material dependencies on biodiversity, our exposure to high-impact companies, and investee companies active in sensitive areas. Companies with high dependencies have the highest physical risks, whereas those with high impacts may have high transition risks. We also monitor if investee companies have sufficient management quality and formulate credible strategies to manage the pressures on the different drivers of biodiversity loss. For each driver of biodiversity loss, we define a driver management score, which indicates how well an investee company manages pressures on that driver. These scores are aggregated in a biodiversity management indicator.

Our analysis is based on data from our data provider MSCI, supplemented with data from SBTi and Forest500. The indicators are a proxy for whether investee companies comply with sector-leading plans and strategies, and if investee companies do their best to reduce pressure on the drivers of biodiversity loss. The indicators included in the analysis differ per sector. Our driver management

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It is important to monitor how our efforts to reverse the trend of biodiversity loss are paying off.

scores measure if issuers have the right policies, targets, commitments, disclosures, strategies, programmes, and management structures and if they are not involved in controversies that undermine the credibility of their efforts. There is no data for the driver 'invasive species'. As the drivers on 'land and sea change' and 'resource exploitation' are similar, we combine both drivers into one indicator.

A non-exclusive list of topics we consider to determine whether investee companies put sufficient effort in reducing their pressures on the drivers of biodiversity loss include:

- **Land and sea change and resource exploitation**
 - Involvement with credible, industry-specific external stakeholder groups, or certification organisations, to verify sustainable practices.
 - Proven impact assessment before initiating activities in new areas.
 - Policies on minimising disturbance, reclaiming habitat, restoration and biodiversity protection efforts.
 - Local community and indigenous people policies and engagement, ethical policies on human and labour rights and on conflict, and employee training on these topics.
 - Policies and programmes on water management, water targets, water efficiency measures, and use of alternative water sources or water recycling.
 - Disclosure on performance of land and sea change and resource exploitation, such as trends of water intensity, areas of land, seabed or forest cover transformation.
 - For soft commodities (palm oil, soy, beef, cotton, leather, seafood and timber or paper) and for minerals, policies that address deforestation, controversial raw material sourcing, external certification with the most stringent standards, and traceability.
 - For investee companies indirectly impacting land and sea change and resource explanation, formulation of policies and strategies that reduce impact in their supply chains and trace the origin of raw materials used, with strict sustainability guidelines on procurement policies, supplier due diligence, and grievance and remedy systems in place.

¹⁸ As co-founder of the carbon and biodiversity accounting platforms for financial institutions (PCAF and PBAF), we have always been a frontrunner in initiating industry collaboration that develops new methods to measure real world impact. For biodiversity accounting, we are waiting for a footprinting method that considers efforts by investee company management to reduce impact. The consequence of selecting immature methods may be that portfolio biodiversity footprints can only be reduced by divesting from investee companies operating near biodiversity hotspots or in water-scarce areas, even if these investee companies have leading management practices that rule out negative biodiversity impact. This would be undesirable from a financial and social point of view and would not help real world sustainable development.

¹⁹ The targets in Cardano's climate and water strategies will also be monitored periodically.

● **Climate change**

- Commitment or approval of science-based greenhouse gas emission targets for scope 1, 2 and 3, with clear target years, intermediate targets, baselines and demonstrated track records.
- Clear mitigation plans with time-bound implementation pathways to use cleaner sources, capture greenhouse gas emissions, improve energy efficiency, or reduce energy consumption, following TCFD guidelines.
- Disclosure of absolute greenhouse gas emissions and emission intensity of own production, also of upstream and downstream emissions by suppliers and clients.
- Proven impact and risk assessment related to climate change mitigation and to physical climate risks, and formulation of actions to mitigate these risks.
- For financial institutions, assess climate-related risks of the investee companies in the sectors most impacted.

● **Pollution**

- Policies to address environmental impacts and formulation of environmental management systems.
- ISO certification or other relevant certifications to reduce risks of pollution or waste, and regular audits to monitor compliance.
- Policies and programmes to reduce toxic emissions, both in own operations and in supply chains.

- Formulation of strict and clear pollution, emissions and waste targets and disclosure on progress, performance and trends.
- Strategies to phase out chemicals of concern, hazardous chemicals and persistent chemicals.
- Strategies to reduce environmental impact of packaging and to improve recycling, recyclability and use of less- harmful alternatives.
- For investee companies indirectly impacting pollution, formulation of policies and strategies to reduce impact in their supply chains, with strict sustainability guidelines in procurement policies, supplier due diligence and grievance and remedy systems in place.

The resulting indicators are proxies for investee company efforts to reverse trends of biodiversity loss or create positive biodiversity impacts. It does not mean that investee companies showing they can manage biodiversity sufficiently well, cannot or should not improve their policies and efforts.

These indicators will be determined periodically to monitor whether the percentage of our investee companies with sufficient biodiversity management practices increases as necessary to move towards our targets.

As new information and new indicators become available, we will establish more precise estimation and monitoring methods, in order to formulate our targets to 2050.



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Abbreviations

CBD	Convention on Biological Diversity
DNB	De Nederlandse Bank – Dutch Central Bank
FBF	Finance for Biodiversity Foundation
GBF	Global Biodiversity Framework
GDP	Gross Domestic Product
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
ISSB	International Sustainability Standards Board
NGFS	Network on Greening the Financial System
PBAF	Partnership for Biodiversity Accounting Financials
PBL	Planbureau voor de Leefomgeving – Netherlands Environmental Assessment Agency
PCAF	Partnership for Carbon Accounting Financials
SBTI	Science-Based Target Initiative
SBTN	Science-Based Target Network
TCFD	Taskforce on Climate-related Financial Disclosures
TNFD	Taskforce on Nature-related Financial Disclosures
UNEP	United Nations Environment Programme
WEF	World Economic Forum
WWF	World Wide Fund for Nature

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