Taskforce on Nature-related Financial Disclosures

Recommendations for upgrading the nature data value chain for market participants

November 2025

Contents

Foreword: Enabling nature intelligence

The resilience of every business depends on the resilience of nature. As nature's resilience declines, the physical, transition and systemic risks to business and finance increase. This underscores the urgent need for every business, regardless of size, sector or geography, to build its *nature intelligence*: the skills and capacity to identify, assess and respond to its dependencies and impacts on nature and the corresponding risks and opportunities to its organisation and those providing capital to it.

Consequently, demand for decision-grade, nature-related data – both data on the state-of-nature and data on an organisation's dependencies and impacts on nature – is now growing rapidly. As outlined in this report, a range of actors – from international organisations and national statistical agencies to new nature data start-ups and financial market data providers – are seeking to satisfy this demand but market participants remain concerned about the quality and reliability of much of the nature-related data available today.

Responding to this challenge requires recognising that authoritative state-of-nature data is a global public good of the highest strategic importance. Addressing global commons challenges requires global common solutions: in this case, stakeholders across the nature data value chain embracing a principles-based approach to upgrading the accessibility, quality and timeliness of state-of-nature data over time; and the generation of new sources of funding to invest in critical data collection efforts and quality upgrades across the value chain.

Doing so will create positive externalities for the data then available to all other nature data users, including governments and civil society organisations. Failure to do so will not only compromise the ability to deliver on the goals and targets of the Global Biodiversity Framework (GBF) agreed to by 198 governments, but also leave nature-risk dangerously unattended to on corporate balance sheets and in capital portfolios, amplifying the systemic risks to our financial systems, economies and societies.

The TNFD is delighted to have assembled a global coalition of leading organisations and experts over four years of successive phases of its work on nature data issues to outline how these challenges can be addressed. The recommendations in this report have been developed with a whole of value-chain mindset and tested by leading upstream data providers and downstream data users to demonstrate their practicality and feasibility. The TNFD now calls on all stakeholders invested in a high-quality, high-integrity nature data value chain as a global public commons asset to step forward and action these recommendations.

David Craig & Razan Al Mubarak
Co-Chairs, TNFD

Executive summary

With humanity now operating beyond seven of nine planetary boundaries, and the global insurance protection gap from climate and nature-related events now estimated by the G20 to exceed USD 200 billion globally per annum and as high in 90% in some emerging economies, high-quality, decision-useful data on the state-of-nature is unquestionably a strategic global public good.[1]

For business and finance, it is the critical enabler of the *nature intelligence* needed to manage risk, resilience and sustainable growth in a world of accelerating climate change and nature loss.[2] For policy makers, businesses and financial institutions, access to high quality nature data is essential to unlock the private finance required to close the global nature finance gap, now estimated by the Paulson Institute at over USD 900 billion per annum[3], and deliver on the aspirations of the Kunming-Montreal Global Biodiversity Framework.

Despite the need, the urgency and the rapid pace of innovations in nature data collection and analytics over recent years that show what's possible, the nature data value chain remains highly fragmented and lacking the investment required to consistently produce the authoritative state-of-nature data required by market participants. The recommendations outlined in this report seek to bring a global commons mindset and systemic approach to addressing these challenges.

The eight recommendations outlined in this report are specific, practical and ready for implementation. They follow, and build on, the needs assessment and contextual analysis outlined in the Roadmap for upgrading market access to decision-useful nature-related data released by the TNFD in 2024. They have been developed with input from a global coalition of partner organisations and through a novel pilot testing and UX design process involving a sample set of over 120 datasets provided by over 40 data providers and tested by 25 downstream nature data users.

The TNFD encourages actors across the nature data value chain to embrace and support these recommendations. Some require voluntary adoption by value chain participants that can start immediately. Others require grant funding to pursue to the next stage. To maximise their impact, they should not be seen as a menu of options but rather a set of interlinked initiatives designed to shift mindsets and incentives; and drive practical action. If

1 G20. (2024) G20 Media Statement: Side Event on Addressing the Natural Catastrophe Insurance Protection Gap. G20, Rio de Janeiro, Brazil.

2 Responsible Investor. (2024) Comment: The Real Gap Is Nature Intelligence, Not Nature-related Data. Responsible Investor, London, UK.

3 Paulson Institute. (2025) Financing Nature 2025. Paulson Institute, Chicago, USA.

implemented, the TNFD is confident that this will result over time in a measurable upgrade in the quality, accessibility, discoverability and timeliness of nature data for market participants.

The initiatives embodied in these recommendations, specifically the call for a global Nature Data Trust and the creation of a Nature Data Public Facility (NDPF), have also been designed to generate much needed additional funding for strategic investment in state-of-nature-data collection over the medium to long term. These institutions can also lead by example by embracing the data principles, metadata and harmonised licensing recommendations outlined in this report. Based on the commercial model outlined in this report and supported by benchmarking and financial modelling undertaken by the TNFD and its partners, the NDPF is forecast to break even in Year 3 (2028 if commenced in 2026), pay contributing data providers licensing fee revenues of USD30 million per annum by Year 5 (2030) and generate an additional surplus of USD2 million per annum by Year 5 (2030) for the Nature Data Trust to invest in data collection and quality improvement projects across the nature data value chain.

Failure to invest in high quality nature data as a strategic public good will leave businesses and financial institutions of all sizes flying blind in the face of accelerating climate change and nature loss. It will also hold back market confidence to invest in new nature-related opportunities and nature financing markets as they seek to scale in the coming years, fuelled by the imperative to transition to a net zero and nature positive future.

Summary of recommendations

Recommendations for all nature data required by market participants:

1. **Global nature data principles**: Address market user data quality and consistency concerns by promoting global adoption of a set of data principles for nature-related data by all actors across the nature data value chain.
2. **Common metadata requirements**: Support data transparency and enable better decision making by end users through the provision of standardised metadata information by all data collectors and aggregators of nature data.
3. **Harmonised data licensing and user agreements**: Address market user concerns about the accessibility and cost of nature-related data through the development and adoption of harmonised nature data provision and usage agreements across the nature data value chain.

Recommendations for state-of-nature data required by market participants:

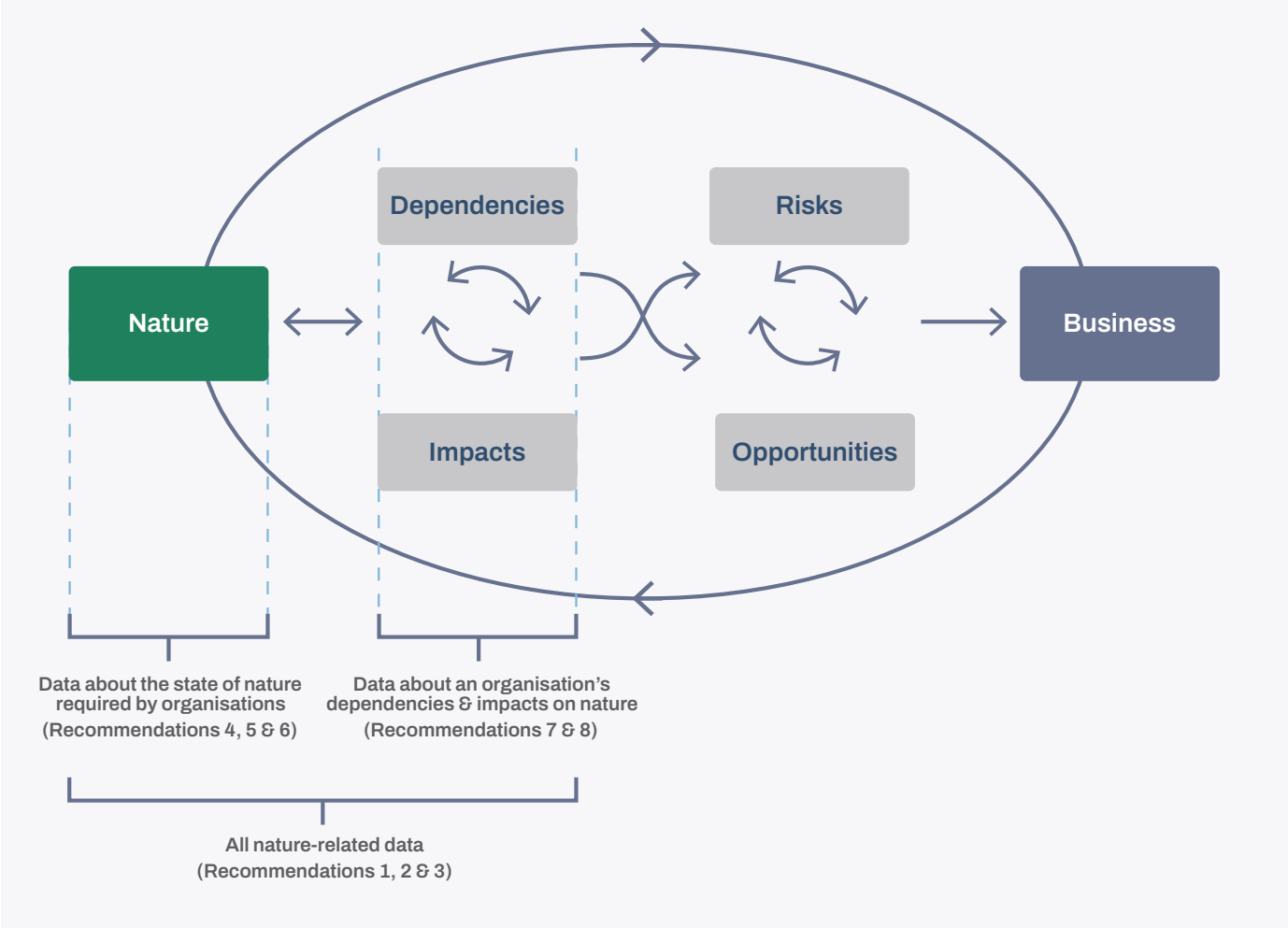
4. **A Nature Data Public Facility (NDPF) to provide open access to core state-of-nature data**: Enable the baseline assessment and reporting of nature-related issues by all companies and financial institutions, including small to medium sized enterprises (SMEs), by launching a Nature Data Public Facility to provide global commons, open access to a core set of decision-useful data about the state of nature around the world.

5. **Incentivising corporate nature data exchange**: Unlock the value of corporate nature data by providing mechanisms and incentives for companies and financial institutions to contribute the state-of-nature data they have collected back into the global commons, through the NDPF, as a recognised and valuable contribution to global policy goals to halt and reverse nature loss.
6. **An international Nature Data Trust to generate new financing for state-of-nature data collection and upgrading of the nature data value chain as essential global commons infrastructure:** Establish an independent international not-for-profit organisation, in the form of a data trust, to generate and redistribute funding for long-term strategic investment in state-of-nature data collection and quality enhancement initiatives across the nature data value chain. This organisation would operate the proposed NDPF (Recommendation 4), consistent with the global nature data principles, metadata standards and common licensing and user agreements (Recommendations 1, 2 and 3) and encourage corporate nature data exchange through the facility (Recommendation 5).

Recommendations for data reported by market participants about their dependencies and impacts on nature:

7. **A nature data measurement protocol**: Support standardisation and consistency of nature-related measurement for the benefit of companies and financial institutions by establishing an international, cross-sector initiative to develop globally applicable, science-based standards for how to measure and account for nature-related dependencies and impacts. This could be modelled on, and learn from, the GHG Protocol for measurement of GHG emissions.
8. **A universal digital protocol for sharing nature data across supply chains**: Respond to the costs and complexities associated with collecting and sharing sustainability data across supply chains (particularly the burden on SMEs facing information requests from multiple downstream customers) by encouraging the development of a standardised global digital protocol for sharing climate and nature-related impact and dependency data (output data) from one company to another.

Figure 1 – Aspects of nature-related data covered by these recommendations



Acknowledgements: Development of these recommendations

The development of these recommendations has been undertaken over three phases of work since the beginning of 2023 in collaboration with the following organisations from around the world and across the nature data value chain. The Taskforce is grateful for the generosity with which they each contributed their time and expertise and the whole-of-value-chain mindset these experts brought to this task. In particular, the Taskforce would like to thank UNEP-WCMC, EY[4] and Icebreaker One for supporting the TNFD in the development and pilot testing of the nature data principles, Capitals Coalition for their investigation into metadata adoption and models for nature data, BCG for its support benchmarking commercial models for the proposed Nature Data Public Facility and Addelshaw Goddard for its support on governance aspects of the proposed Nature Data Trust and Nature Data Public Facility.

The Taskforce would also like to thank the many individuals and other organisations that provided feedback, contributed to focus groups, and participated in pilot testing and thematic work streams in 2025 to help determine these recommendations.

4 Ernst & Young New Zealand (EY) was engaged by the Taskforce on Nature-related Financial Disclosures (TNFD) as advisor to this Document under its direction in accordance with the engagement agreement dated 16 April 2025, including the General Terms and Conditions. This Document is owned by the TNFD. EY disclaims all responsibility to any other party for any loss or liability that the other party may suffer or incur arising from or relating to or in any way connected with the Document, the provision of the Document to the other party or the reliance upon the Document by the other party.

Table 1: Participants in TNFD's programme of work on nature-related data

Phase 1 – Scoping study January – August 2023	Phase 2 – Roadmap development March – October 2024	Phase 3 – Recommendations development February – October 2025
Co-sponsors of the scoping study	***Technical expert group***	***Project steering committee and partners***
• CDP • Climate Collective • Global Biodiversity Information Facility (GBIF) • Global Commons Alliance (GCA) • Global Reporting Initiative (GRI) • Open Earth Foundation (OEF) • MRV Collective • NatureFinance • Science Based Targets Network (SBTN) • Systemiq • UNEP-WCMC	• Capitals Coalition • Environmental Systems Research Institute (Esri Inc) • EU-Knowledge Centre for Biodiversity (KCBD) • Global Biodiversity Information Facility (GBIF) • Global Canopy • Group of Earth Observations, Biodiversity Observation Network (GEO BON) • Institute of Public and Environmental Affairs (IPE), China • International Union for Conservation of Nature (IUCN) • Nature Finance • Net Zero Data Public Utility (NZDPU) • OS-Climate (OS-C) • Regen Network (RN) Institute for the Development of Environmental-Economic Accounting • REV Ocean/HUB Ocean • Science Based Targets Network (SBTN) • The South African National Biodiversity Institute (SANBI) • Research Institute for Humanity and Nature, Tokyo University, Japan • UNEP-WCMC	• **Addleshaw Goddard** • **Anglo American** • **Capitals Coalition** • **Esri Inc** • **EY** • **FSD Africa** • **Future of Sustainable Data Alliance (FoSDA)** • **Global Biodiversity Information Facility (GBIF)** • **Global Canopy** • **Icebreaker One** • **IUCN** • **Nature Positive Initiative (NPI)** • **Oliver Wyman** • **Open Geospatial Consortium (OGC)** • **PWC** • **SBTN** • **The Data Foundation** • **Toha** • **UNEP-WCMC** • **WWF**

Table 2: List of 2025 pilot programme participants

Phase 3 – Pilot participants				
Upstream – Data providers			**Downstream – Data users**	
			Corporates:	***Financial institutions:***
• Amazon Environmental Research Institute (IPAM) • Biodiversity Centre of Japan • Biome Inc • BirdLife International • Carmargo, Rafael • CDC Biodiversité (subsidiary of Caisse des Dépôts (CDC), France) • Centre of Agri-Food Benchmarking • CSIRO, Australia • C-Trees • Department of Forestry, Fisheries and the Environment (DFFE), South Africa • Endangered Wildlife Trust (EWT) • Fundação Nacional dos Povos Indígenas (FUNAI) • Global Biodiversity Information Facility (GBIF) • Geosphere Environmental Technology Corporation • Group on Earth Observations (GEO)	• GEO Atlas • Waseda University • Japan Aerospace Exploration Agency (JAXA) • Japan International Cooperation Agency (JICA) • JAXA Earth Observation Research Center • MapBiomas • Map of Life • Ministry of Science, Technology and Innovation (MCTI), Brazilian Biodiversity Information System (SiBBr) • Mozaic Earth • Natural History Museum • New Zealand Institute for Bioeconomy Sciences • Resolve • R-evolution AB (Hexagon) • South African National Biodiversity Institute (SANBI)	• KBA Partnership (SANBI and BirdLife International) • Space Intelligence • Space4Good • Stanford Natural Capital Project • The Landbanking Group • Think Nature Inc. • Toha Network • Tohuku University • UNEP-WCMC • University of Cambridge • Water Footprint Network • Wildlife Conservation Society (WCS) • World Resources Institute (WRI) • WWF Risk Filter Suite • Yale Center for Biodiversity and Global Change	• Acciona • BHP • Dexco • Natura • NEC Corporation • Motiva • Sibanye Stillwater • Sinese • Suntory Holdings Ltd • Suzano • Toyota • Vale	• BTG Pactual • Development Bank South Africa (DBSA) • Farm Credit Canada (FCC) • FirstRand • MS&AD Insurance Group • Standard Bank
				Market intermediaries:
				• Ecovadis • Bloomberg • Capgemini • I CARE • Vizzuality

Context for these recommendations

In October 2024 at the UN Convention on Biological Diversity COP16 meeting in Cali, Colombia, the TNFD released a Roadmap for upgrading market access to decision-useful nature-related data. Based on 12 months of extensive consultations with companies and financial institutions, technical discussions with nature data experts from leading scientific, conservation and private sector organisations, and consultation with the UN and other international agencies, it identified a number of critical 'pain points', needs and opportunities across the nature data value chain.

First, the need to enable the nature intelligence of every business by addressing nature data usage 'pain points' experienced by companies and financial institutions today. These centre around the discoverability, quality, timeliness, accessibility and decision-usefulness of state-of-nature data layers required for increasingly common use cases. These include:

- Nature-related issue assessment and corporate reporting;
- Site-level planning and development approval analysis;
- The design, financing and delivery of nature-related opportunities (including nature-based solutions (NbS)); and
- Nature-related corporate target setting and transition planning aligned to the goals and targets of the Kunming-Montreal Global Biodiversity Framework (GBF).

Second, the opportunity to catalyse a systemic uplift in the quality of nature-related data for all users. As outlined in the TNFD's *Roadmap* report, this needs to be done by mobilising actors across the nature data value chain to adopt a shared, principles-based approach reinforced by a programme of data collection and quality improvement initiatives across the nature data value chain.

Third, the opportunity to 'unlock' the public value of the enormous amount of high-quality nature data collected on a regular basis by companies, typically for one-time project approvals, for example, as part of an environmental impact assessment (EIA), or site-level monitoring and regulatory reporting. Often collected at great expense but only used once, much of this data could be liberated from corporate feasibility studies to contribute to better global coverage and insight about the state-of – nature around the world.

Finally, and perhaps most strategically, the TNFD's Roadmap report recognised that as the climate and nature crises accelerate, high-quality, nature-related data must be seen as a strategic public good and needs orders of magnitude greater funding to deliver the quality, coverage and temporality of nature-related data now required. This is not just required by and for scientists and government

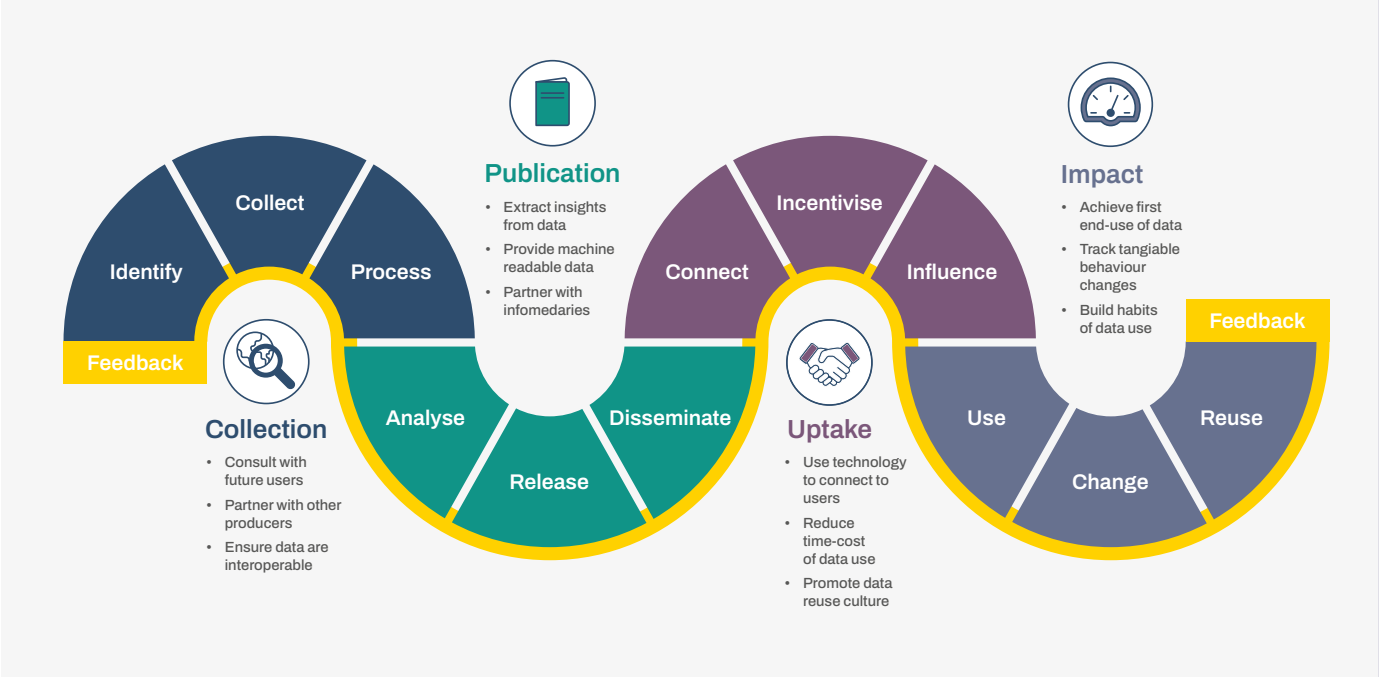
Key goals:

- Enable the nature intelligence of every business
- Catalyse a systemic uplift in the quality of nature data
- Unlock the public value of commercially collected state-of-nature data
- Mobilise additional funding for state-of-nature data collection

policy makers, but increasingly by business and finance sector decision makers as well. For example, one study in 2016 estimated that an additional USD114 million would be needed to deliver baselines of data coverage for four global biodiversity and conservation knowledge products.[5]

Further detailed analysis of the findings of the Taskforce's engagement with market participants, and their perspectives on the challenges and opportunities associated with upgrading the nature data value chain, can be found in the Roadmap report, which is an important foundation for the recommendations outlined below.

Figure 2: The nature data value chain



Since the publication of the *Roadmap* report in late 2024, the TNFD and a coalition of nature data partners have iterated further on potential responses to these challenges, including the concept of a Nature Data Public Facility (NDPF) first proposed by the Taskforce in August 2023. This included an extensive programme of global consultations and pilot testing of specific propositions in 2025. This involved:

- A series of workshops and focus groups with over 100 nature data experts globally, and value chain participants both online and in person, in London, Beijing, New York, New Delhi, Sao Paulo and at the IUCN Conservation Congress in Abu Dhabi;

5 Davies, T. W., Duffy, J. P., Bennie, J. and Gaston, K. J. (2016) Stemming the Tide of Light Pollution Encroaching into Marine Protected Areas. PLOS ONE 11(8).

- Evaluation of over 40 nature data sets against a refined set of nature data principles first proposed in the *Roadmap*; and
- Pilot testing of a demonstrator NDPF with 120 data sets from over 40 nature data providers – both primary data collectors and aggregators – and more than 25 downstream nature data users, including large data and analytics service providers, small consulting firms and corporate end users.

This report represents the fourth and final phase of work on nature-related data issues to be led by the TNFD. The Taskforce's attention will now turn to mobilising other actors invested in the success of a globally robust nature data value chain – including policy makers, philanthropists, scientific and conservation organisations and market participants – to step forward in a collaborative, whole-of-value-chain approach to implement the recommendations outlined in this report.

Figure 3: TNFD's programme of work on nature-related data

Key insights grounding our recommendations

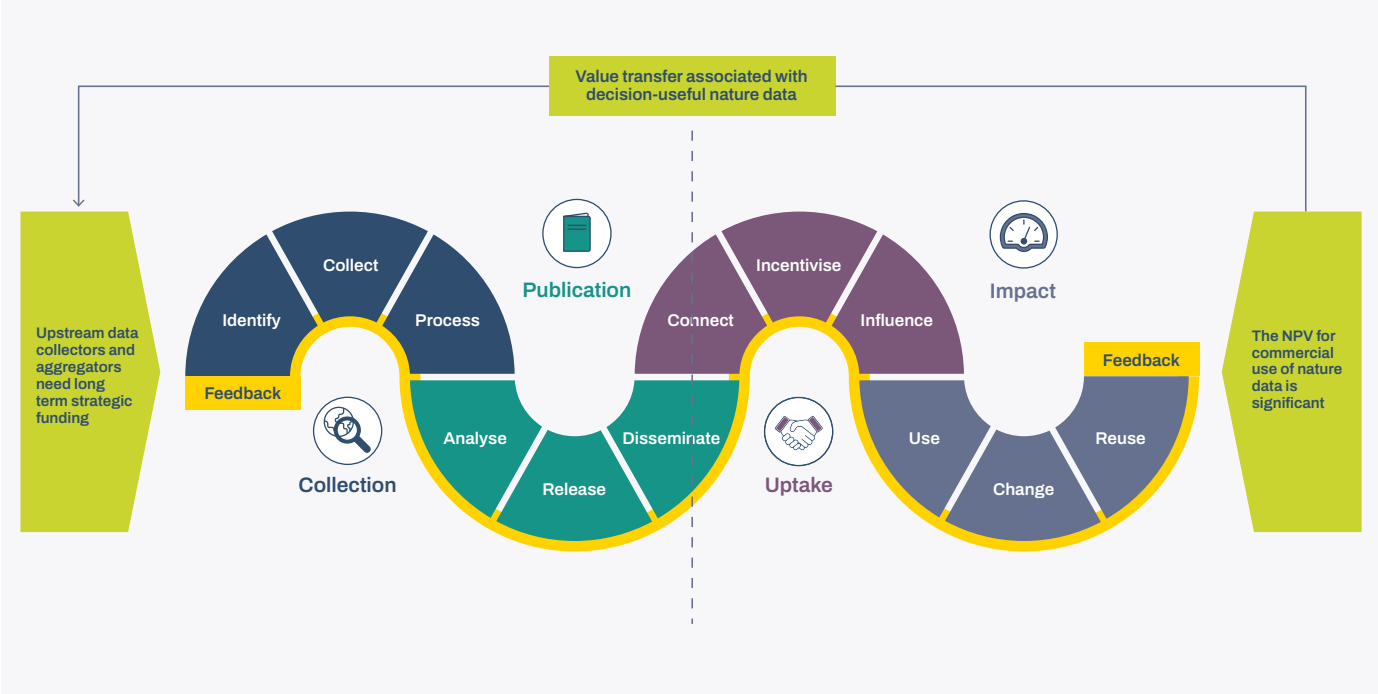
A two-sided market challenge

Building on the 2024 Roadmap report and to prepare the ground for these recommendations, the TNFD brought together demand-side and supply-side perspectives across the nature data value chain at a workshop convened in London in March 2025. This group of 25 global nature data experts agreed that the challenges within today's nature data value chain can be characterised as a 'two-sided market' problem.

- The 'downstream' commercial end of the nature data value chain is vibrant, innovative and funded by private sector risk capital responding to new demand drivers such as policy focus and new corporate disclosure standards and obligations. While a growing number of nature data startups are moving quickly to meet evolving customer needs, in the race for market share many are moving upstream to collect and clean state-of-nature data layers, and/or filling data gaps with modelled data. Market users have told the Taskforce that they welcome the innovation and choice provided by these product and service providers but remain concerned about the 'black box' quality of many product offerings. This is causing confusion and concern about what solutions are required and whether those solutions will ultimately inform the right decisions and support assurable disclosures to investors and other stakeholders.
- At the same time, the 'upstream' collection and aggregation of the world's most authoritative state-of-nature data is dependent on the expertise and networks of predominantly publicly funded government and scientific institutions. Most continue to struggle to secure the government and philanthropic funding required to maintain existing state-of-nature data sets and invest in new data collection efforts. Seeking new funding and sensing commercial market opportunities emerging downstream of their core competencies, some are looking to move into the commercial value-added data and analytics space. As a result, some of their publicly funded state-of-nature data is being placed behind paywalls and incorporated into fee-for-service arrangements too costly for many market users, in particular SMEs.

In short, while the world's repository of state-of-nature data is a strategic global public good, the net present value of future commercial demand is significant and growing at the same time front-line data collectors and aggregators are struggling to fund the collection and updating of the state-of-nature data layers required.

Figure 4: A two-sided market challenge



The lack of funding to support a high quality, high integrity nature data value chain will become an increasingly significant binding constraint on effective and timely action across the global economy and society. Upstream public institutions collecting the world's most authoritative state-of-nature data need long-term funding to support the expansion of their collection efforts. For downstream data and analytics providers, higher-quality observed state-of-nature 'input' data into their products and platforms will help build customer confidence and reduce costs associated with data scraping, cleaning and modelling.

Addressing the challenge

These dynamics highlight the need and urgency to embrace a 'global commons' approach. The TNFD believes it is both essential and possible to create a mechanism – in the form of a global commons data trust – to redirect the present and future 'downstream' commercial value of high-quality nature data to large companies and financial institutions back 'upstream' to the public nature data collection and aggregation organisations that provide these essential state-of-nature data layers and need access to new, stable and long-term funding.

Strategic, long-term investment is necessary, but not sufficient. Business and financial markets customers come with new and different requirements that are largely unfamiliar to legacy state-of-nature data providers and aggregators. Much of the state-of-nature data available today lacks the same focus on key data attributes such as timeliness, accessibility and assurability evident in other global data value chains, such as those in corporate

accounting, financial markets and critical infrastructure management. Consequently, additional funding must be accompanied by a whole of value-chain commitment to upgrade the discoverability, quality, timeliness and assurability of state-of-nature data.

While the Taskforce does not underestimate the challenge of mobilising a whole-of-value-chain approach, many of the world's leading state-of-nature data collection and aggregation organisations have partnered with the Taskforce to develop these recommendations, building on their existing scientific and open data standards. The Taskforce believes that if implemented together, the suite of eight recommendations set out in this report will catalyse this step-change in data quality required. As market confidence and trust in nature data increases through a principles-based approach, additional funding can be generated for upstream data collectors and aggregators to reinvest in their efforts on behalf of all actors in society.

Recommendation 1 – Global nature data principles

Address market user data quality and consistency concerns by promoting global adoption of a set of data principles for nature-related data by all actors across the nature data value chain.

Context

As the TNFD began aggregating feedback from market participants about their experience with state-of-nature data, it became clear that a significant theme of concern was around confidence and trust, particularly about whether data layers would meet specific sustainability reporting and assurance needs for external reporting to investors, regulators and other stakeholders.

Given the challenges identified by market participants, the TNFD and a range of nature data partner organisations concluded that a principles-based approach should be used as a lever to improve data quality and accessibility across the nature data value chain. Data principles and data standards are widely used across most data landscapes to inform data collection and aggregation efforts on a continuous improvement basis, and deliver quality, consistency and trust to end users over time.

Table 3: The role of data principles in addressing nature data challenges.

Nature data challenges	Role of data principles
Increasing mandatory and voluntary disclosure is creating a **need for higher-quality data**	**Standardise expectations for data quality**, comparability and accessibility
Users **lack confidence** in the credibility, reliability and provenance of data for decision-making	**Build trust** in data by setting expectations on documented methodologies, accuracy controls and provenance
Different formats and methodologies make it **difficult to compare data** across companies or geographies	**Promote interoperability and standardised metadata**, facilitating consistent and comparable data
Data may be **infrequently updated**, reducing its relevance for analysis and reporting	**Encourage timely updates**, ensuring data remains relevant and decision-useful
Paywalls and licensing restrictions can make data **less accessible**, especially for SMEs, but in many cases provide a vital source of funding	**Encourage clarity in licensing terms to reduce barriers and improve accessibility, promote increased openness of data access where funding and governance structures allow**

Scientific data principles and standards, such as FAIR and CARE, are well established among scientific and nature conservation data collectors and aggregators. Initiatives and organisations such as Biodiversity Information Standards (TDWG) and the Global Biodiversity Information Facility (GBIF) have played a key role in defining scientific data principles and supporting their widespread adoption over many years. The nature data community has also embraced more recent efforts to promote and adopt open data principles to provide greater transparency and discoverability.

It was agreed that existing scientific and open data standards provided a strong foundation, but that sustainability reporting and assurance data principles also needed to be satisfied to meet the particular needs of business and financial institution data users. To support interoperability, the nature data principles recommended in this report draw on concepts from these, and other, established sustainability reporting, scientific and open-data standards and frameworks, including:

- **Scientific data principles**: FAIR and CARE principles.
- **Open data and interoperability principles**: the FAIR Guiding Principles, the Open Data Charter, the UK GEMINI metadata standard (v2.3), and EU INSPIRE.
- **Indigenous data governance and ethics**: CARE Principles.
- **Sustainability reporting and assurance data principles:** Including principles outlined by the International Financial Reporting Standards (IFRS) in the IFRS S1 standard (for general sustainability disclosure requirements) and by the International Auditing and Assurance Standards Board (IAASB) ISSA 5000 standard published in 2024.

The Kunming–Montreal Global Biodiversity Framework (GBF) provided policy context for outcomes and targets and the NOVA Principles developed by Icebreaker One for trust frameworks were also informative.

The Taskforce review of these scientific, open data, and sustainability reporting and assurance data principles and standards found significant areas of conceptual overlap and consistency, even if specific labels and descriptors varied slightly across the different reference sources. In the Roadmap report of 2024, the TNFD aggregated these into a list of 10 data principles. Upon further review and pilot testing this year, the TNFD believes these can be distilled further into a set of seven recommended data principles and 20 underlying criteria designed as a composite and integrated framework.

The TNFD recommends the following seven nature data principles be adopted by nature data collectors, aggregators, distributors and end-users across the nature data value chain to help improve the discoverability, quality, temporality, consistency and decision-usefulness of nature data for market participants.

Table 4: Proposed nature data principles (v1.0)

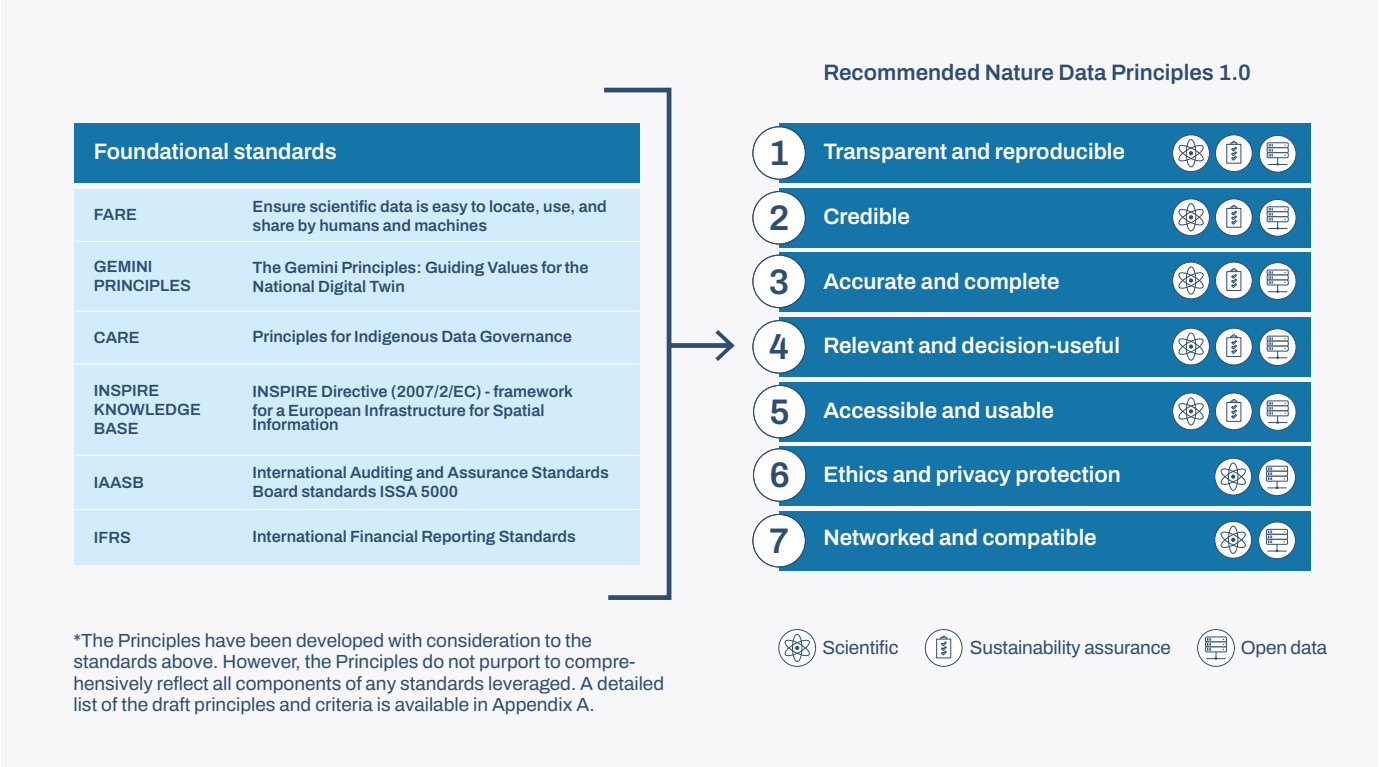
Data Principle	Definition
Transparent and reproducible	Provide a clear and accurate summary of the available data, including methodologies, assumptions and processes used in data collection and processing, and any resulting limitations in data quality, coverage and applicability to support understanding and reusability in line with the FAIR Guiding Principles.
Credible	Provide documentation that demonstrates the data has been prepared by a competent, capable and trustworthy source recognised as having authority, and is managed under clear governance policies to support reliability of the data.
Accurate and complete	Provide transparency about the data quality and the level of accuracy and completeness to help guide users in its interpretation and use. Put processes in place to identify and address any errors within the dataset, including redress mechanisms to support trust and accountability in the event of misrepresentation.
Relevant and decision-useful	Provide information for the user to understand how the data meets the specifications for the use case for which it is recommended and can support purposeful decision-making and analysis by the user.
Accessible and usable	Ensure data is findable, retrievable, understandable and usable for the broad community of users by minimising unnecessary access restrictions – in line with FAIR Guiding Principles for Findability and Accessibility – and incorporating user feedback and support mechanisms to guide data use and continual improvement.
Ethics and privacy protection	Uphold ethical standards in data collection and sharing by respecting individual rights, collective benefits, legal frameworks, licenses and Indigenous data sovereignty. This includes implementing controls to protect data integrity and avoid harm to biodiversity or communities involved in data collection and governance, in line with CARE Principles for Indigenous Data Governance.
Networked and compatible	Design data to be interoperable and compatible with other datasets and platforms, ensuring it can be easily discovered, and linked and integrated across systems in line with the FAIR Guiding Principles for Interoperability.

Annex A provides additional details of the associated assessment criteria for each of these principles.

Together, these data principles, if adopted widely and consistently across the nature data value chain, will go a long way to addressing many of the pain points experienced by market participants in their use of nature data today.

- They address the issues of discoverability, accessibility, comparability and transparency by setting common expectations for documentation, provenance and governance (Transparent and Reproducible; Credible), and by promoting interoperable formats and linkages so datasets can be compared and integrated across tools and platforms (Networked and Compatible).
- They also respond to the need for decision-relevance, including clarity on spatial/temporal resolution and update frequency so users can assess if they are fit-for-purpose in specific use cases (Relevant and Decision-useful).
- Finally, they seek to balance the need for broad access and responsible use, improving usability while protecting rights, licensing clarity and considering Indigenous data sovereignty, where applicable (Accessible and Usable; Ethics and Privacy Protection).

Figure 5: Foundational standards informing the nature data principles



*The Principles have been developed with consideration to the standards above. However, the Principles do not purport to comprehensively reflect all components of any standards leveraged. A detailed list of the draft principles and criteria is available in Appendix A.

Insights from pilot testing

To test the applicability and practicality of these data principles and gauge the current state-of-nature data against these principles, the TNFD conducted a unique pilot test between March and September 2025 with a wide range of state-of-nature data providers. This pilot testing was focused on a sample set of state-of-nature data layers aligned to three initial use cases:

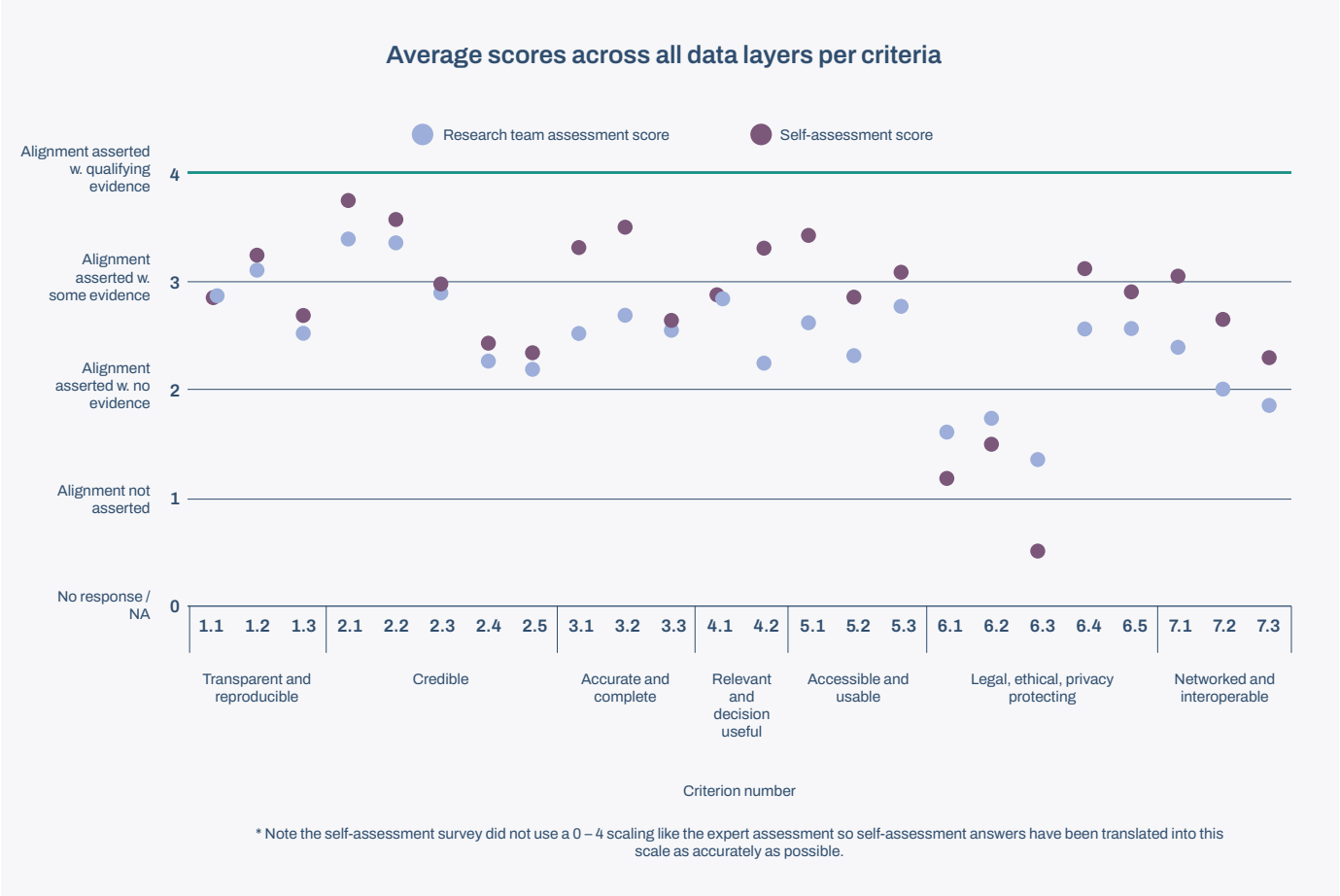
- Nature-related issue **assessment and corporate reporting** aligned to the LEAP approach and disclosure recommendations of the TNFD;
- **Target setting analysis and reporting** aligned to the methods of the Science Based Targets Network (SBTN); and
- **Other potential state-of-nature assessment requirements** as proposed and currently being pilot tested by the Nature Positive Initiative (NPI).

UNEP-WCMC, Icebreaker One and EY provided specialist technical support to the TNFD and over 40 upstream data providers and data aggregators – including national statistical bodies, the UN and other international organisations, and conservation groups – submitted 120 data sets into the pilot testing programme. The participating pilot testers are listed in the Acknowledgements section of this report.

More than 100 data sets were self-assessed by the organisations providing them, with a sample set of 40 independently assessed by the pilot testing technical partners. Participating data providers were asked to provide supporting evidence to help qualify each data layer's adherence to each of the seven data principles (and the 20 criteria or proof points across the data principles).

The findings of the pilot testing are illustrated below, with the top line of the graph representing full and complete alignment to each of the seven principles:

Figure 6: Findings from the pilot testing of proposed nature data principles



Note: Refer to Table 7 in Annex A for further detail on the proposed nature data principles (v1.0) and associated evidence criteria

Participating data providers found the testing process for this set of data principles illuminating and educational. While only covering a small sample size of the world's state-of-nature data layers, the process also highlighted how data collectors and aggregators can coalesce around a shared set of nature data principles.

As expected, the sample set of data layers generally performed well against established scientific data principles, with more significant gaps against open data, Indigenous data consent, and sustainability reporting and assurance principles. The graph above clearly shows the attributes of data quality where data layers performed well; and the dimensions where further investment in nature data quality is required.

69% of downstream pilot testing participants surveyed by the TNFD agreed or strongly agreed that 'the draft data principles area helps them to assess whether a dataset is trustworthy, relevant and fit for their needs.'

- Evidence gaps: While approximately one-third of data layers surveyed were self-assessed as being aligned across all criteria, none of those self-assessments supplied full supporting evidence. The TNFD recognises that the pilot testing period was relatively short, and that with more time to assemble and provide evidence, the assessed outcomes could be higher.

- Scientific foundations: The TNFD's analysis found strong performance on accepted methods and attribution, indicating a solid baseline.
- Legal/ethical gaps: On these dimensions of quality, the pilot testing revealed generally lower scores and interpretability issues. These are areas where awareness and capacity building will be critical. Alignment to CARE principles that cover Indigenous community consent over the nature data collected on, or about, their territories is a particular challenge. This will need to be phased in over time as modalities for the coordination of data collection and the securing of consent become better understood.

The Taskforce is confident that endorsement by, and application of, these data principles by actors across the nature data value chain is achievable over time. This will serve as a practical, consistent standard for all upstream data collectors and aggregators, with the benefit of elevating trust, consistency and usability for their downstream data customers.

Recommendations for nature data principles

1a. Establish a cross-sector data governance mechanism that includes standard setters, scientific experts, and Indigenous Peoples and Local Communities (IPLC) organisations. This body should oversee the continuous refinement and implementation of the nature data principles through transparent, participatory processes, including a regular review cycle. Ongoing engagement will ensure that the principles remain scientifically robust, ethically grounded and contextually relevant across jurisdictions.

1b. Create and support capacity building among nature data providers, whether public sector or private sector, to promote the consistent adoption of the principles. This should include a particular focus on the application of the CARE principles and ethical considerations around IPLC-related rights.

1c. In implementing the principles, establish a trust framework that includes both data providers and independent assessment mechanisms for datasets, to ensure transparency and build confidence and support that they are being consistently applied. Within key nature data platforms, including the proposed Nature Data Public Facility, create dedicated support functions, such as expert helpdesks and advisory services, to assist providers and facilitate large-scale adoption of the principles.

Moving to action – implementing these recommendations

The TNFD encourages all stakeholders across the nature data value chain to voluntarily adopt these seven data principles when upgrading legacy state-of-nature data layers and creating new data layers.

Coordinating the voluntary adoption of these data principles could be undertaken by one or more cross-sector collaborative initiatives, or as proposed below, by a new Nature Data Trust (Recommendation 6), to coordinate whole of value-chain upgrades, including the implementation of these recommendations.

Recommendation 2 – Common metadata requirements

Support data transparency and enable better decision making by end users through the provision of standardised metadata information by all data collectors and aggregators of nature data.

Context

Improving the quality and usability of nature data relies on the consistent application of standardised metadata across the entire nature data value chain. These can be used to enhance machine readability, AI-enabled cataloguing and iterative testing to further aid decision-usefulness for report users, including investors. Common metadata requirements are typically consulted on and agreed through a collaborative value chain platform. This has been lacking across the nature data value chain to date.

> *"Consistent, comparable metadata helps navigate options."*
>
> Sustainability consultant

Insights from pilot testing

Persistent inconsistencies in metadata across the nature data value chain are undermining trust, usability and interoperability.

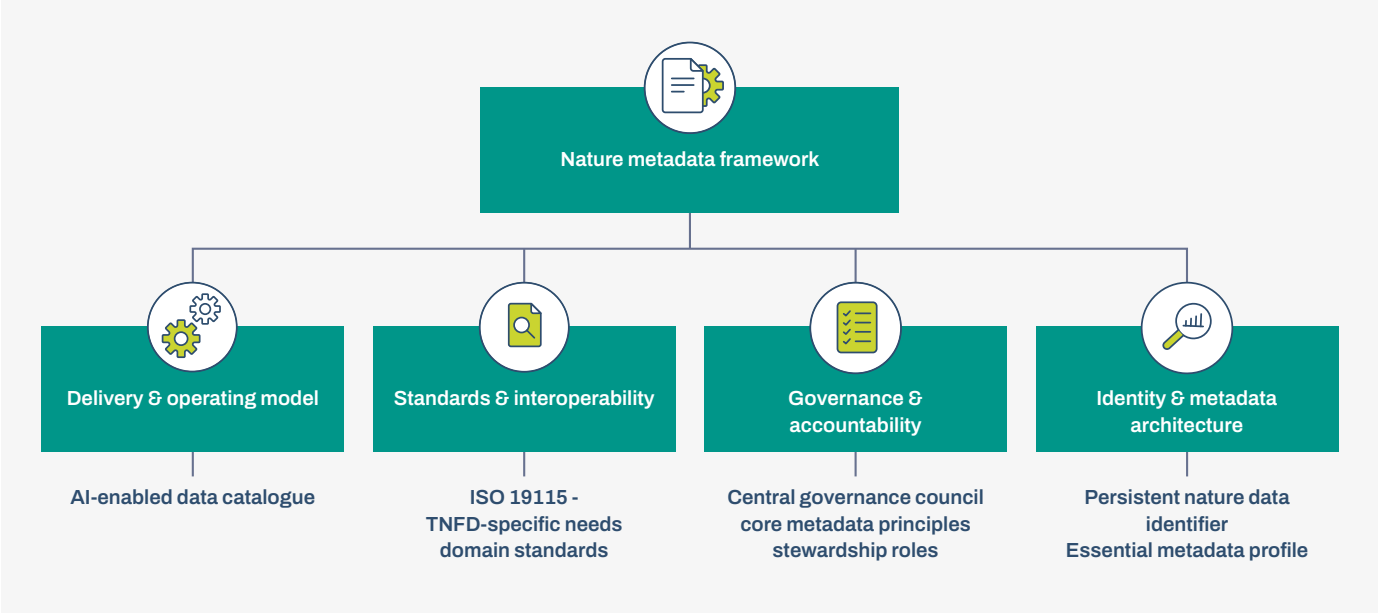
- Sixty-one percent of data providers participating in the TNFD review and pilot testing of state-of-nature data layers reported not using formal metadata standards, with many lacking clear governance, accountability or defined quality processes.
- Metadata submissions were often incomplete or inconsistently structured, revealing important gaps in documentation, categorisation and methodological transparency.
- Many datasets lacked verified provenance, geographic specificity and sufficient methodological detail to support comparability and integration.
- Only a small proportion of data providers applied recognised international standards, such as ISO 19115, while most relied on partial or locally defined approaches.

Without coordinated governance and a core metadata profile, datasets will continue to be fragmented, incomplete and difficult to integrate. The absence of persistent identifiers and standardised citation practices further limits traceability, accountability and adherence to the FAIR (Findable, Accessible, Interoperable, Reusable) and CARE (Collective Benefit, Authority to Control, Responsibility, Ethics) principles. This has the effect of reducing collaboration, reuse and auditability.

The lack of automated cataloguing and structured testing also leaves traceability and verification weak, raising audit risks and reducing confidence among users and investors. This will also negate adherence to the ISSB's XBRL taxonomy requiring well-structured, machine-readable disclosures.

Implementing clear governance, an AI-enabled catalogue and standardised metadata architecture is therefore essential to deliver scalable, credible and decision-useful nature data that underpins both transparency and market integrity

Figure 7: Components of a nature metadata framework



Some 88% of downstream pilot testing participants surveyed by the TNFD agreed or strongly agreed that *the metadata provided in the Nature Data Public Facility would make it easier to search, filter, compare and assess relevance of data.*

Recommendation regarding metadata requirements

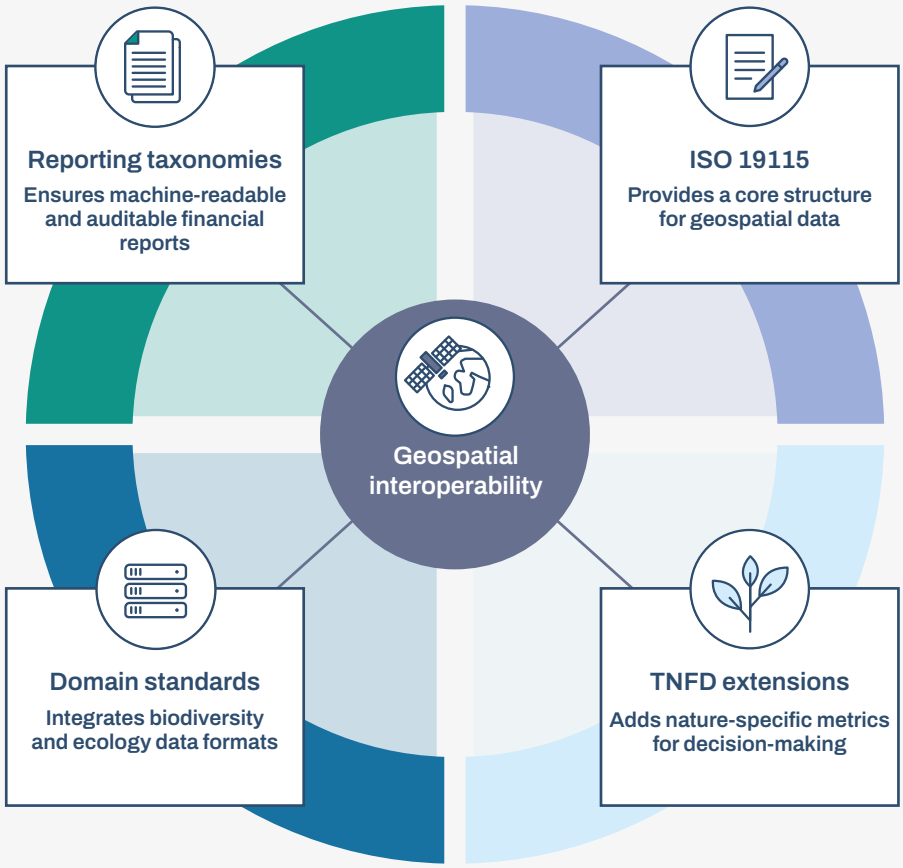
These issues with nature metadata can be addressed through the development of a robust identity and metadata system, anchored by a persistent Nature Data Identifier (ND.ID). Adoption of four internationally recognised metadata standards provides the foundation for consistent description and interoperability of nature-related data.

- At the core sits ISO 19115, which defines the geospatial metadata structure and ensures syntactic and structural interoperability across systems.

- Complementing this, three domain-specific frameworks address specialised data types:
  - Darwin Core for biodiversity and species information;
  - Ecological Metadata Language (EML) for ecological and environmental datasets; and
  - MIxS for genomic and microbiological data.

Geospatial data already adheres to an existing consistent, internationally recognised syntax and structure based on ISO 19115, ensuring uniform description, interoperability and seamless exchange of geospatial information across systems and organisations. Adoption of the established ISO standard would provide a core for nature-related data that is geodata. Together, these standards would establish a harmonised and extensible basis for the publication and exchange of nature data.

Figure 8: Achieving geospatial interoperability through nature metadata



To achieve this outcome, the TNFD recommends the following specific actions:

2a. Establish a nature metadata governance mechanism to provide oversight and accountability for the development and implementation of a unified metadata framework for use across the nature data value chain. This framework would encompass delivery of the recommendations in this section of this report. Metadata governance should define clear decision rights, legitimacy and scope through a transparent and representative process, supported by agreed voting protocols and accountability measures.

2b. Publish core metadata principles as part of the metadata framework, reflecting stewardship, standardisation, quality, assurability and transparency.

2c. Launch a persistent Nature Data Identifier (ND.ID). A centralised ND.ID registry guarantees unique, persistent and resolvable identifiers for all datasets, ensuring that each ID is distinct and that any user or system can reliably locate the corresponding dataset or metadata for seamless discovery and citation by machine or human users (the FAIR findability principle). Illustrative elements include unambiguous ID strings, checksums and optional QR encoding to support physical-digital linkage.

2d. Adopt ISO 19115 as the geospatial core publishing a standardised profile defining consistent fields and conformance rules, recognising that ISO 19115 primarily addresses syntax and structural interoperability.

2e. Develop nature indicator, metric extensions and map semantics incorporating additional elements for decision-useful nature metrics related to, for example, biodiversity, habitat integrity, water quality and ecosystem services. Appropriately reuse or establish controlled vocabularies with mapping and alignment to ensure consistent meaning and interoperability across datasets.

2f. Ensure machine readable, auditable data for reporting by integrating domain standards and reporting taxonomies mapping biodiversity/ecology data via Darwin Core, EML and MIxS to align nature finance disclosures using an XBRL taxonomy, as called for by the ISSB. The use of controlled vocabularies with mapping and alignment will ensure that nature-related terms and measurements have consistent meaning (semantics), making data digitally comparable and aggregation reliable. Seamless integration of domain standards like Darwin Core and MIxS will allow complex ecological and biodiversity data to flow directly into the reporting system without loss of detail. The resulting financial disclosures will be produced using an XBRL taxonomy that is consistent with global reporting standards.

Moving to action – implementing these recommendations

If necessary, and in the absence of an existing international institution or mechanism that could coordinate implementation of these initiatives, the governance for the development of this metadata framework could be provided by the Technical Advisory Board of the Nature Data Trust as proposed in Recommendation 6.

Recommendation 3 – Harmonised data licensing and user agreements

Address market user concerns about the accessibility and cost of nature-related data through the development and adoption of harmonised nature data provision and usage agreements across the nature data value chain.

Context

While different nature data users have different requirements, persistent challenges mentioned by market participants are the time, direct cost and opportunity costs of needing to procure different state-of-nature data layers required from multiple suppliers, each with their own licensing and data use terms and conditions. This level of fragmentation across the nature data value chain hinders data access, interoperability and innovation, and imposes unnecessary costs on business and finance end users.

- Some companies and financial institutions interviewed by the TNFD have cited a need to enter into up to 10 different licensing and usage agreements, some taking over six months to negotiate with the data provider. This imposes significant direct costs such as legal review beyond the costs charged by the vendor for the data layer itself.
- The lack of standardised commercial licenses often leads to bespoke or restrictive agreements, increasing complexity and reducing discoverability and reuse. Varied licensing language hinders reuse, particularly for SMEs and potential downstream analytics service providers.
- Ambiguity regarding permitted use, derivative creation, attribution and downstream rights results in risk aversion and missed opportunities for downstream users, including consultants, analytics service providers and end customers.

> *"Sometimes institutions publish datasets that cannot be used for commercial purposes, without a way to get a commercial license or a straightforward route to commercial access."*
>
> Sustainability analyst, leading European bank

Insights from a review of existing market practice

With the assistance of legal counsel from Addelshaw Goddard, the TNFD has reviewed a number of existing market licensing and data use agreements and undertaken a comparative analysis of current practice across the nature data value chain. A number of key insights emerged:

- While recognising that a range of data licensing and use agreements are required to service the needs of different user types, promoting the use of common terms and conditions within agreements would reduce time, cost, legal uncertainty and operational friction for both upstream data providers and downstream data users.
- It would also enable data pooling and better integration of nature data into other data and analytic workflows.
- Prioritising, where possible and appropriate, Creative Commons licenses for state-of-nature datasets would also lower barriers and maximise reuse, helping to circulate datasets more broadly.

> *"We are not against paying, but licensing information is rarely transparent or standardised."*
>
> Biodiversity Data Scientist, Government-owned financial services company

Together, these actions would create the foundation for greater interoperability, discoverability and legally certain data sharing. Their implementation would advance the resilience of the nature data value chain for all participants.

Box 1 – Creative Commons Licenses

Creative Commons or CC provides a number of licenses that can be used with a wide variety of creations that might otherwise fall under copyright restrictions, including music, art, books and photographs. Although not tailored for data, CC licenses can be used as data licenses because they are easy to understand.

The permission level provided by a Creative Commons data license can be understood from its name, which is a combination of two-letter 'permission marks'. For example, the CC BY-ND license specifies that users must credit the creator of the data and cannot create any derivatives.

Table 5: Creative commons license types

License	Features	Recommended use	Jurisdiction
CC0 (No Rights Reserved)	Public domain dedication; no rights reserved; free copying, modification and sharing.	Raw data, baseline datasets.	**Global – recognised under international copyright law in all Berne Convention jurisdictions; widely used across EU, US, UK and Australia.**

License	Features	Recommended use	Jurisdiction
CCBY (Attribution)	Attribution required; permits reuse and adaptation for commercial and non-commercial purposes.	Most nature datasets, research use.	**Global – version 4.0 applies internationally and replaces older jurisdiction specific 'ported' versions.**
CC-BY-SA (Attribution-ShareAlike)	Requires attribution; adaptations must carry the same license, keeping works open.	Derived datasets or collaborative/open projects.	**Global – ported to 50+ jurisdictions under CC international framework.**
CC BYNC (Attribution Non-Commercial)	Attribution required; limits reuse and redistribution to non-commercial purposes.	Education, research and nonprofit use.	**Global – international version 4.0 valid across Berne Convention jurisdictions.**
CC BYND (Attribution No Derivatives)	Attribution required; redistribution allowed only in original, unmodified form.	Official datasets or verified reports requiring version integrity.	**Global – governed by CC BYND 4.0 International (non-ported).**
Open Data Commons Public Domain Dedication and License (ODC PDDL 1.0)	Public domain dedication for databases; allows unrestricted copying and reuse.	Metadata and large, open database releases.	**Global – developed by Open Data Commons and legally applicable across jurisdictions recognising database or copyright rights.**

Recommendations for data licensing and usage agreements

3a. Encourage the use, where possible and appropriate, of Creative Commons licenses, such as CC0 (public domain dedication) and CC BY (attribution required), for state-of-nature datasets to maximise reuse and integration. This supports open access while making clear that where restrictions are required by law or data sensitivity, these must be explicitly detailed and justified.

3b. Mandate or strongly encourage Open Government Licence (OGL) or equivalent for publicly funded or government-origin datasets, which is fully compatible with Creative Commons Attribution (CC BY 4.0).

3c. Develop clear, standardised language for commercial licensing terms to enable value-added and proprietary datasets to be made available under defined conditions without precluding open foundational access.

3d. Encourage value-chain-wide use of a common core of licensing terms for value-added or proprietary commercial datasets (e.g. end user license agreements) that specify:

- Permitted uses (corporate reporting, research, internal insight, commercial redistribution);
- Pricing, royalties and revenue-sharing terms where appropriate;
- Rights to derivatives and restrictions on sublicensing; and
- License duration and renewal.

With respect to a 'common core' of terms and conditions that can be used across licensing agreements, the TNFD recommends the following:

- **Scope of license:** Define data covered, permitted uses, geographic reach and duration of the license for commercial reuse. Including specificity of how the datasets, derived works and metadata can be used.
- **Commercial use rights:** Articulate which commercial activities are permissible including resale, value-added products, integration with commercial platforms and direct commercial exploitation.
- **Attribution and citation:** Set out requirements for acknowledging data providers and the facility in commercial outputs, with standard attribution statements and linkage to license references.
- **Data quality and provenance:** Mandate data provider responsibilities regarding accuracy, updates and full provenance documentation. Detail audit rights or dispute processes for quality concerns.
- **Update and maintenance obligations:** Specify expectations for data currency, timetables and processes for data revisions, and protocol for deprecating outdated records.
- **Fees and payment terms:** Set out requirements for fees/payment for use, payment deadlines and action if payment is not received (i.e. revocation of license).

- **Liability and indemnification:** Clarify limitations of liability for both data providers and users. Detail indemnity clauses for third-party claims, breaches, errors or negligence.
- **Access controls and tiered licensing:** Use tiered models to address open, restricted and paid commercial access. Differentiate pricing, access levels and support for SMEs versus large enterprises.
- **Intellectual property and moral rights:** Define IP ownership, moral rights waivers, obligations on derivative works and provisions for withdrawal of provider data under certain circumstances.
- **Data privacy and sensitive content:** Include requirements for data providers to comply with privacy laws; specify handling and disclosure of sensitive environmental, community or personal data.
- **Governing law and dispute resolution:** State applicable law and mechanisms for conflict resolution, arbitration or recourse, especially for cross-border data sharing.
- **Audit:** State provider and/or intermediary rights to audit licensee use of the data to ensure compliance with license terms. Detail audit periods and requirements of the licensee.

Moving to action – implementing these recommendations

The TNFD encourages all stakeholders across the nature data value chain to default wherever possible to Creative Commons licensing terms (Recommendation 3a) as a starting point for state-of-nature data licensing. National and sub-national governments, their ministries and entities, including state-owned enterprises, are encouraged to adopt Open Government License (OGL). Efforts by the Open Government Partnership (OGP) to promote global adoption of this licensing framework should be further expanded.

The Nature Data Trust (Recommendation 6) and NDPF (Recommendation 4), if launched, should embrace these licensing recommendations in their own contracting arrangement in order to set an example and help catalyse a broader shift in the approach to data licensing across the nature data value chain.

Recommendation 4 – A Nature Data Public Facility

Enable the baseline assessment and reporting of nature-related issues by all companies and financial institutions, including small to medium sized enterprises (SMEs), by launching a Nature Data Public Facility (NDPF) to provide global commons open access to a core set of decision-useful data about the state of nature around the world.

Context

As outlined earlier in this report, the significant recent growth in market demand for high-quality, state-of-nature data has created a two-sided market problem. The upstream data provision end of the value chain is largely dependent on the activities and expertise of publicly funded institutions, which continue to struggle for stable, long-term funding. At the same time, the downstream end of the value chain, comprised of market service providers and end-users, has seen an explosion of nature data tech startups and analytics product and service providers funded in anticipation of near-term regulatory drivers for greater corporate reporting and growing interest in climate and nature finance. Consequently, upstream data providers are looking to move downstream in search of revenue-generating opportunities to help finance their data collection and aggregation efforts; and downstream data and analytics services providers have been moving quickly to fill upstream coverage and data quality gaps with modelled data solutions.

Insights from pilot testing

Given that most businesses and financial institutions are just starting to use state-of-nature data, unfamiliarity and a lack of confidence are key barriers to action. While growing momentum behind voluntary and, in some jurisdictions, mandatory nature-related reporting has provided an impetus for many large businesses and financial institutions to engage, trust and confidence concerns have been compounded by the proliferation of new commercial data and analytics solutions.

A separate but related pressure impacts small to medium sized enterprises (SMEs). They are likely to experience an increase in information requests from their downstream customers and capital providers for nature-related information – expectations they should be able to meet without significant additional cost or specialist expertise.

This two-sided market challenge highlights the need and opportunity to recognise state-of-nature data as a global public good that requires a global commons solution. It should be designed to achieve three core objectives:

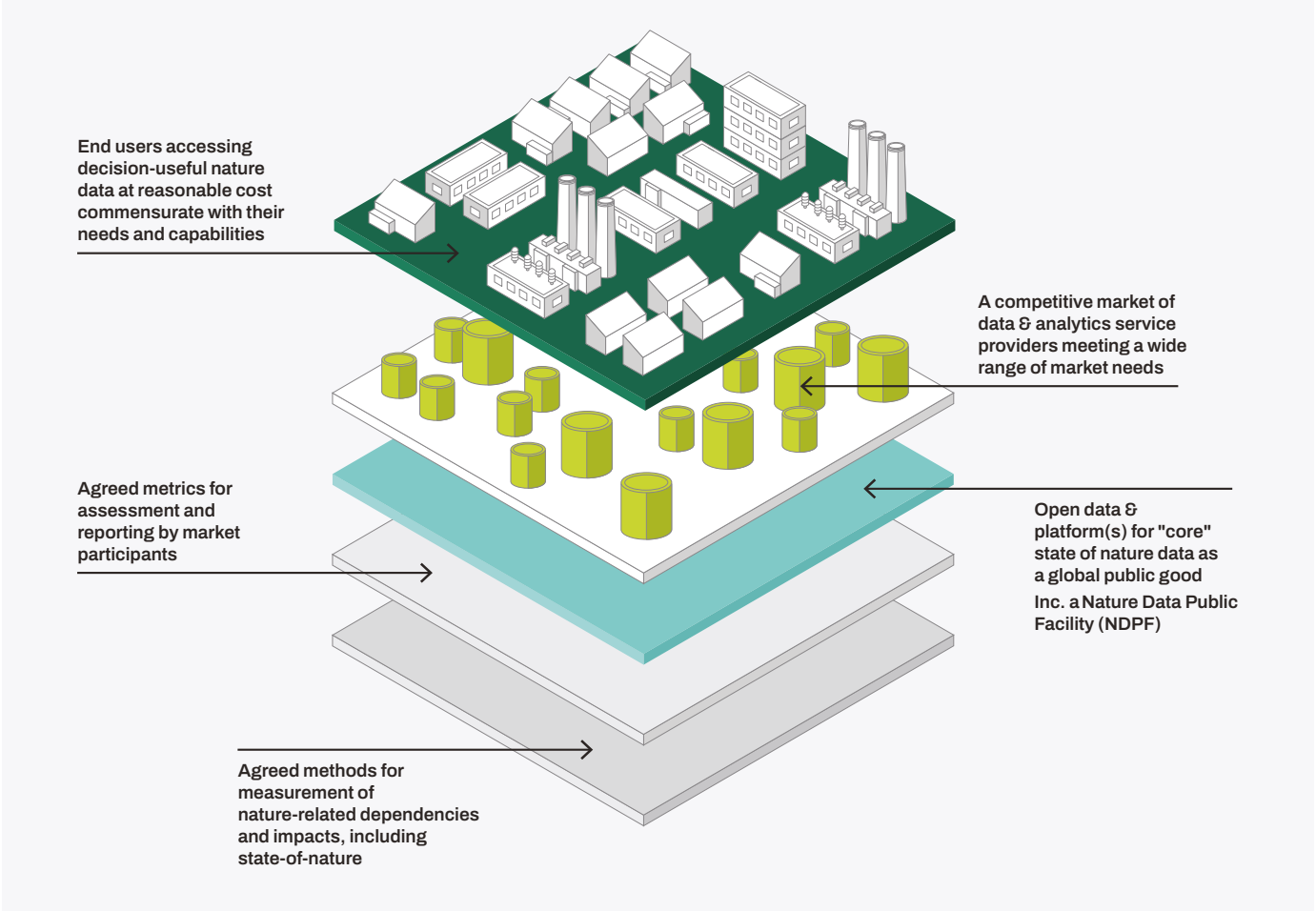
- **Providing open access** to essential state-of-nature data for all businesses and financial institutions;
- **Improving state-of-nature data quality over time** across the value chain and for the benefit of all value chain participants, from collection and aggregation to end use; and
- **Generating additional financing for state-of-nature data** collection and initiatives to enhance data quality across the value chain, particularly for publicly funded international, national and civil society organisations.

The concept of a Nature Data Public Facility

To respond to this challenge, the TNFD released a concept note for a Nature Data Public Facility in August 2023 to achieve these three objectives. The vision for the proposed NDPF is to create a 'public good' nature data broker that provides access to decision-useful, state-of-nature data that corporates and financial institutions can use for their assessment, corporate reporting, target setting and transition planning activities.

The facility – operated as an international, revenue-generating initiative – would focus on streamlining the connection of high-quality upstream providers of state-of-nature data with downstream business and finance sector users. The intention is neither to 'crowd in' upstream data collectors and aggregators given their specialised skills and capabilities; nor to 'crowd out' downstream private sector analytics providers given the need for innovative solutions to rapidly evolving market needs.

Figure 9: The role of an NDPF within a value-adding nature data ecosystem



Since the publication of the 2024 Roadmap report, the TNFD has collaborated with a coalition of partners to further develop the technical and operational design for a NDPF, undertaking pilot testing with both upstream and downstream value chain participants. Esri provided a dedicated 'sandbox' environment, which enabled feedback from over 70 upstream data providers and more than 25 downstream data users, offering valuable insights on the NDPF concept and prospective user experience. Specialist technical support on the application of the nature data principles outlined in Recommendation 1 was contributed by UNEP-WCMC, Icebreaker One and EY.

The Taskforce is now confident to recommend that the NDPF be established.

Recommendations for a Nature Data Public Facility

4a. Build and operate a Nature Data Public Facility as a global commons initiative acting as a trusted broker, providing open access to high-quality, state-of-nature data relevant to market participants.

4b. Place the adoption of, and adherence to, the nature data principles (Recommendation 1) and the metadata framework (Recommendation 2) at the heart of the operating model of the NDPF to ensure it encourages best practice and acts as a catalyst for principles-based continuous quality improvement across the whole value chain.

4c. Implement a tiered licensing structure, with open access as the baseline, to improve market accessibility to state-of-nature datasets for target business and finance use cases (Recommendation 3).

4d. Structure the governance and financial arrangements of the proposed Nature Data Public Facility to deliver its long-term financial viability and generate surplus funds for distribution back to upstream data providers and for investment into quality improvement initiatives across the value chain. The governance and financing of the NDPF as an independent international initiative would be provided by the Nature Data Trust as outlined in Recommendation 6 below.

A blueprint for the NDPF

Based on the concept note released in 2023 and extensive market consultations and pilot testing over the past two years, the TNFD has set out a blueprint for the proposed NDPF to help expedite funding decisions to enable its launch. These strategy and operational design recommendations were developed by a Project Steering Committee assembled by the TNFD to support the development of the recommendations outlined in this report but also to oversee design and pilot testing of the NDPF concept specifically.

Intended focus and target use cases

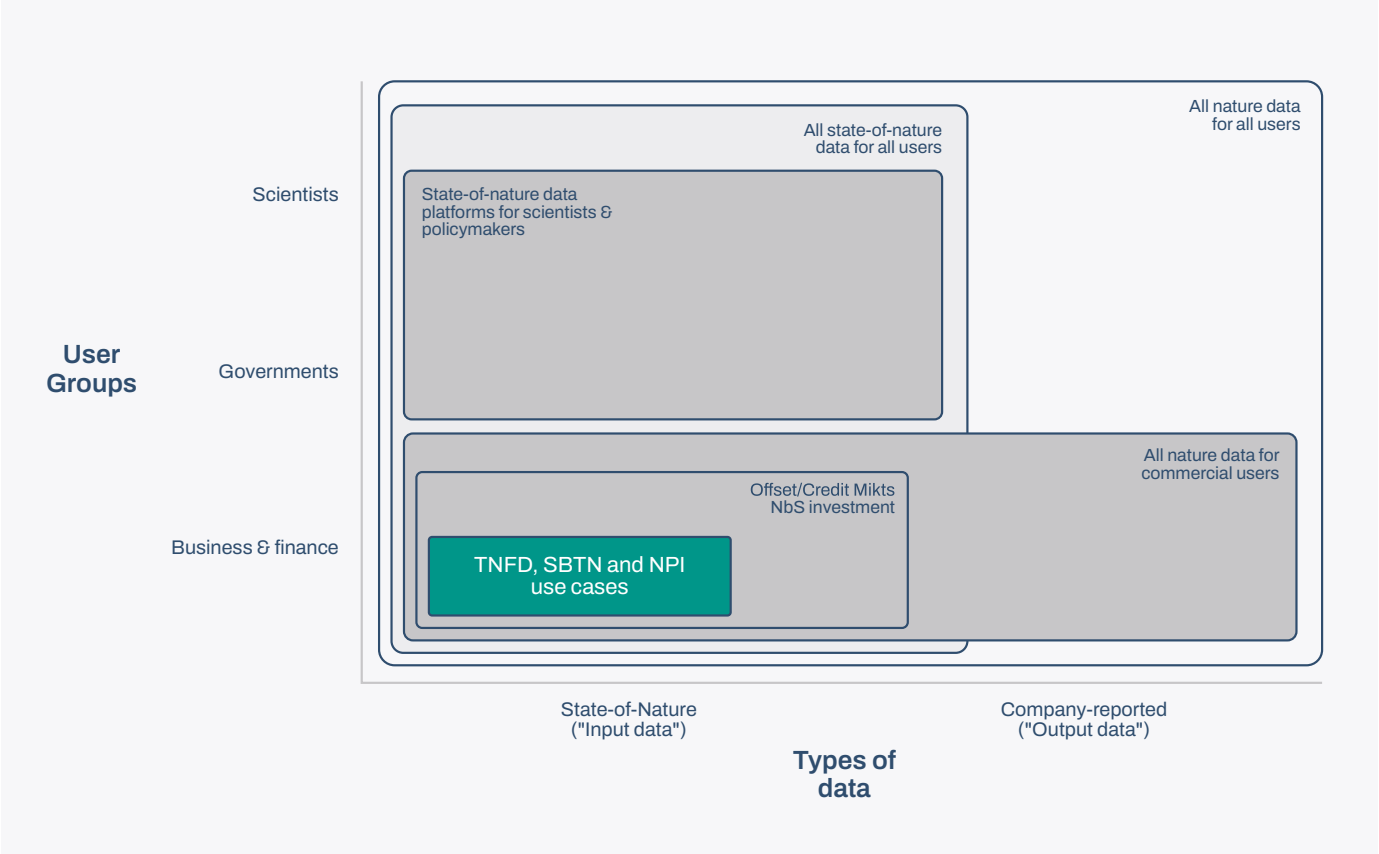
While the TNFD recognises that many other users of nature data – including governments, scientific organisations and civil society actors – also have needs for high-quality, state-of-nature data, the TNFD believes the facility should, in the first instance, seek to address the specific needs of market participants. The TNFD also recommends that the NDPF starts by focusing on a small number of specific business and finance sector use cases for nature data layers:

- **Internal assessment and external reporting** of nature-related issues as called for by the TNFD, specifically, its LEAP assessment approach and 14 recommended disclosures;

- **Nature-related transition planning, including science-based target setting** by companies using the nature in transition planning guidance produced by the TNFD and the target setting methods recommended by the Science Based Targets Network (SBTN); and
- **Other related corporate uses of state-of-nature metrics**, leveraging the state-of-nature metrics now under development and pilot testing by the Nature Positive Initiative (NPI).

As a public facility, however, there would be no barriers for other actors to access the data layers provided through the NDPF. As a result, the NDPF is likely to create significant positive spill-over effects by providing high-quality, state-of-nature data that could be used by many other actors. Once established and operating on a sustainable financial footing, the governance body overseeing operation of the NDPF could review and expand the scope of its mandate, data coverage and services, potentially to other users of nature data, as part of its long-term growth plan as a global public data platform.

Figure 10: Proposed initial focus of the NDPF



Target users

Based on the use cases outlined above, it is envisaged that the NDPF would focus on serving five primary types of market participants:

Market intermediaries:

1. **Financial market data and analytics service providers:** 'Market intermediary' users of state-of-nature data that combine and reuse it with other data layers to provide data products and solutions to hundreds or thousands of customers, typically large companies and financial market participants.
2. **Large consulting companies**: Advising hundreds or thousands of clients on their assessment and reporting requirements, both companies and financial institutions, potentially reusing state-of-nature data layers alongside, or incorporated into, their own proprietary data and analytics tools.
3. **Small advisory firms**: Advising a relatively small number of clients on sustainability issues, typically using third-party data and analytics tools in support of their advice to clients.

End users

1. **Large multinational companies and financial institutions**: End users interested in procuring state-of-nature data layers for their own corporate use, including their external corporate reporting to investors and other stakeholders.
2. **Small to medium sized enterprises (SMEs)**: End users interested in procuring state-of-nature data layers for their own corporate use and for incorporation into supply chain reporting to their downstream customers.

The TNFD is particularly mindful of the needs of the world's 400 million SMEs. While most small organisations are not subject to external corporate reporting obligations such as CSRD in Europe or BRSR in India, it is essential that every small organisation in every sector and every geography develops *nature intelligence* as highlighted earlier in this report. Most SMEs also face a growing list of information requests from their downstream customers about their impacts and dependencies on nature.

While large companies and financial institutions can procure external technical experts and third-party data sources to support their internal assessment and external reporting activities, the vast majority of small organisations do not have the financial resources to procure these specialist inputs. Therefore, it is particularly critical that the design of the NDPF ensures small organisations have free access to state-of-nature data so they can assess their own nature-related issues and help meet the information requests they receive from downstream customers. The TNFD recommends that small and micro end-user organisations of less than 50 employees and <USD 2 million revenue be cross-subsidised by the fees earned from larger users so that data can be provided at no cost to these users.

Key aspects of the operating model

To meet the information needs of these user groups, and based on pilot testing using a sandbox NDPF with a wide range of data layers and downstream users, the TNFD recommends the following operational principles:

1. **A principles-based approach:** The cornerstone of the design of the NDPF is to address market concerns about trust and confidence in nature data by ensuring the application of the nature data principles and metadata framework recommended in this report (Recommendations 1 and 2). The TNFD proposes that the facility begins operation by using a trust framework and ensuring adherence to the common set of metadata outlined in Recommendation 2 in this report. This metadata, including confidence flags against each of the criteria within the data principles, will provide clarity and transparency to data users, enabling them to make their own decisions about which data sets and data layers they wish to use. Over time, the facility can consider whether to adjust the quality thresholds by which data is permitted to enter the facility and made available to downstream users.
2. **A focus on access to data, not the provision of value-adding services:** The NDPF is designed to focus on open, trusted access to a core set of high-quality, state-of-nature data layers, not the provision of analytic tools and services beyond basic search and geospatial interface capabilities. This is to ensure universal, open access with a basic level of UX functionality and to enable (and not crowd out) more advanced data and analytic solutions developed and provided by private sector actors.
3. **A focus on connecting data, not collecting data:** The NDPF is explicitly intended to connect, not collect, data, hence the notion of it as a facility, not a utility or warehouse of state-of-nature data. The NDPF will do this by building its technical architecture around Application Programming Interfaces (APIs), or rules to connect and share data. This API-facilitated model ensures that data ownership and associated rights are retained by the data collectors or aggregators upstream of the facility. APIs would be in place with contributing upstream data provision partners, enabling the facility to have on-demand access only to those data layers of relevance to its target use cases.The facility would also have APIs with its downstream customers, passing required data layers from upstream data providers through the facility to these users.
4. **Model the use of best practice, harmonised licensing and user agreements, maximising adherence wherever possible to appropriate open data standards:** As a global commons state-of-nature data platform with many participating data providers and data users, the NDPF is ideally positioned to be an exemplar for best practice data licensing. As such, it would adopt the data licensing recommendations in this report (Recommendation 3) and apply them as a tiered licensing structure, with open access as the baseline. This will ensure that foundational datasets remain available for the universal public good, research and disclosure purposes. Commercial or value-added datasets will be addressed through differentiated, though harmonised, transparent and interoperable licenses that clarify commercial rights and obligations, address data

quality and provenance, set out robust attribution and citation requirements, and include processes for updates, maintenance, audit and dispute resolution.

The following structure is proposed as a reference for harmonised license development.

Table 6: Proposed approach to data license harmonisation

Principle	Description
Openness as a foundation	Foundational datasets are available under open licenses, accessible without discrimination or barriers to entry, except where explicit restrictions are mandated by law or data sensitivity, such as jurisdictional regulatory or statutory controls on data protection.
License uniformity	The same license terms apply regardless of user or intended use wherever possible, ensuring equitable access for individuals, organisations and commercial entities.
Attribution and provenance	All datasets are accompanied by metadata specifying provenance, versioning and required attribution, fostering transparency and proper crediting.
Interoperability	Licenses are assessed for compatibility with other open data ecosystems and repositories, supporting pooling, linking, and integration for both commercial and non-commercial use.
Adoption and recognition	Existing, standardised licensing options are adopted where suitable, for example, CC0, CC BY, OGL, ODC PDDL
Avoidance of restrictive licensing	NDPF datasets are provided under non-restrictive licensing, enabling broad use requirements (e.g. commercial reuse, end-user, derivative works/product, software and data access).
Commercial datasets	Commercial datasets are provided for the NDPF by using a single, differentiated, transparent and interoperable license that supports open access and innovation.

5. **Generation of additional funding for upstream data provision partners:** As outlined below, the Facility will pay contributing data providers for the data layers they provide and look to accumulate surplus funds for disbursement, via the Nature Data Trust, back to data providers to support their data collection efforts over the medium to long term.

Envisaged services and User Experience (UX) provided by the NDPF

Between March and September 2025, the TNFD and its partners pilot tested these UX models with a range of upstream data providers and downstream data users through a sandbox environment provided by ESRI. This UX testing highlighted two desired and complementary modes of access to serve different user needs and levels of technical capability. Together, these would ensure that both end-users and market service platforms can discover, visualise, and integrate state-of-nature data efficiently and securely.

1. **'Retail' access** – via a web-based geospatial interface designed for end-user organisations such as corporates, financial institutions and consulting firms. This user experience will enable organisations to visualise and overlay state-of-nature data layers with their own location-based information (e.g. asset locations). The API framework will support this retail interface, enabling users to license and download selected datasets in standardised formats for integration into their proprietary data platforms, with appropriate controls on data rights, authentication and versioning.
2. **'Wholesale' access** – via features designed for institutional and large-scale users such as market data and analytics service providers in the same API framework above. This channel will enable on-demand, programmatic access to relevant data layers for integration into the proprietary platforms and analytical services of these users. Wholesale users would also be able to use the facility's hexbin view to visualise data layers and to assess data richness, coverage and availability across specific countries or regions before integrating or licensing datasets.

Both access models would be underpinned by the facility's core metadata registry, licensing service and governance layer, to ensure that all datasets, however accessed, are accompanied by consistent metadata, standardised licence terms, provenance records and quality indicators. This shared foundation will provide a single point of truth for data discoverability, ensure compliance with data principles, and enable interoperability across both retail and wholesale channels.

The screenshots below illustrate the web-based geospatial interface tested for 'retail' access with a range of downstream corporate and financial institution pilot testers.

An interactive video demonstration of the user experience is also available through the TNFD website here.

Figure 11: NDPF sandbox landing page showing the three user entry points

Figure 12: NDPF sandbox with area of interest polygon drawn, filter options open and relevant datasets showing

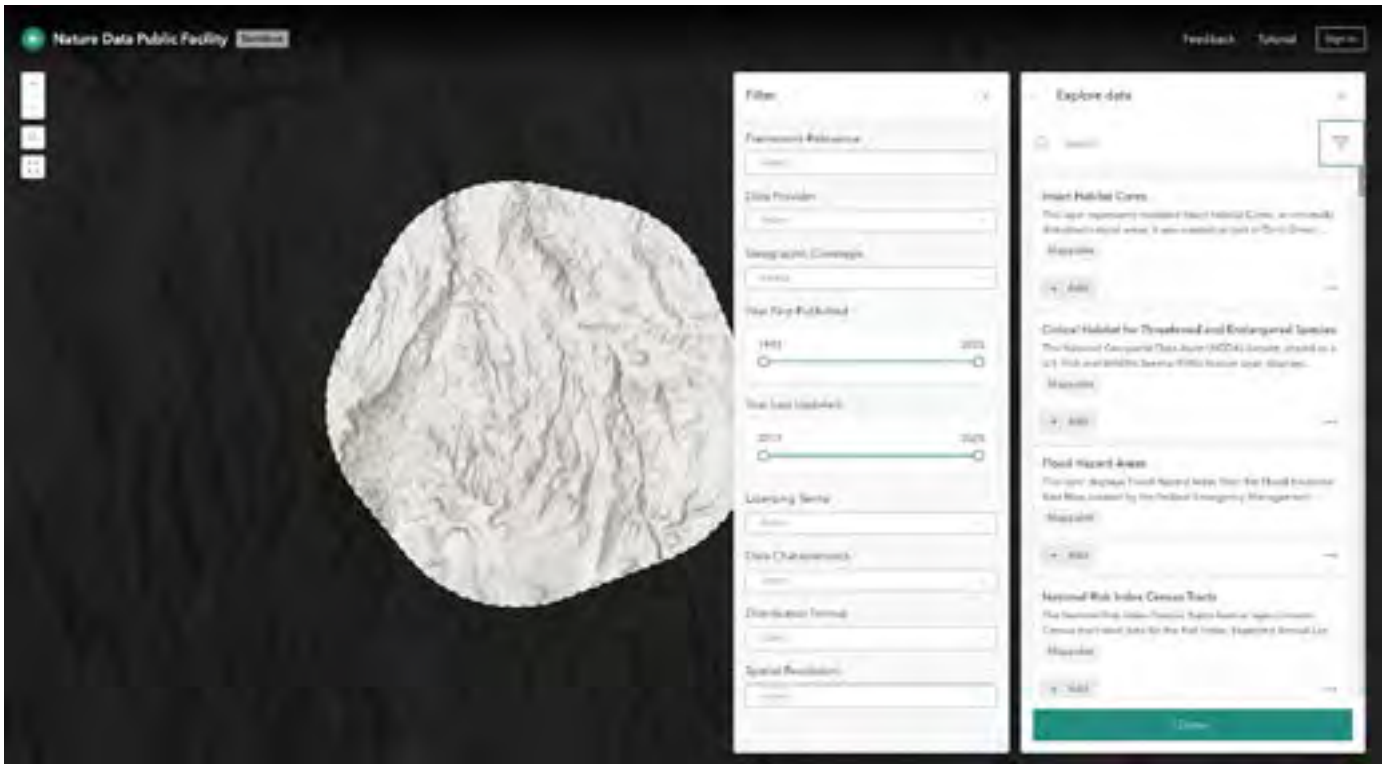


Figure 13: NDPF sandbox with area of interest polygon drawn, filter options applied and a relevant dataset showing

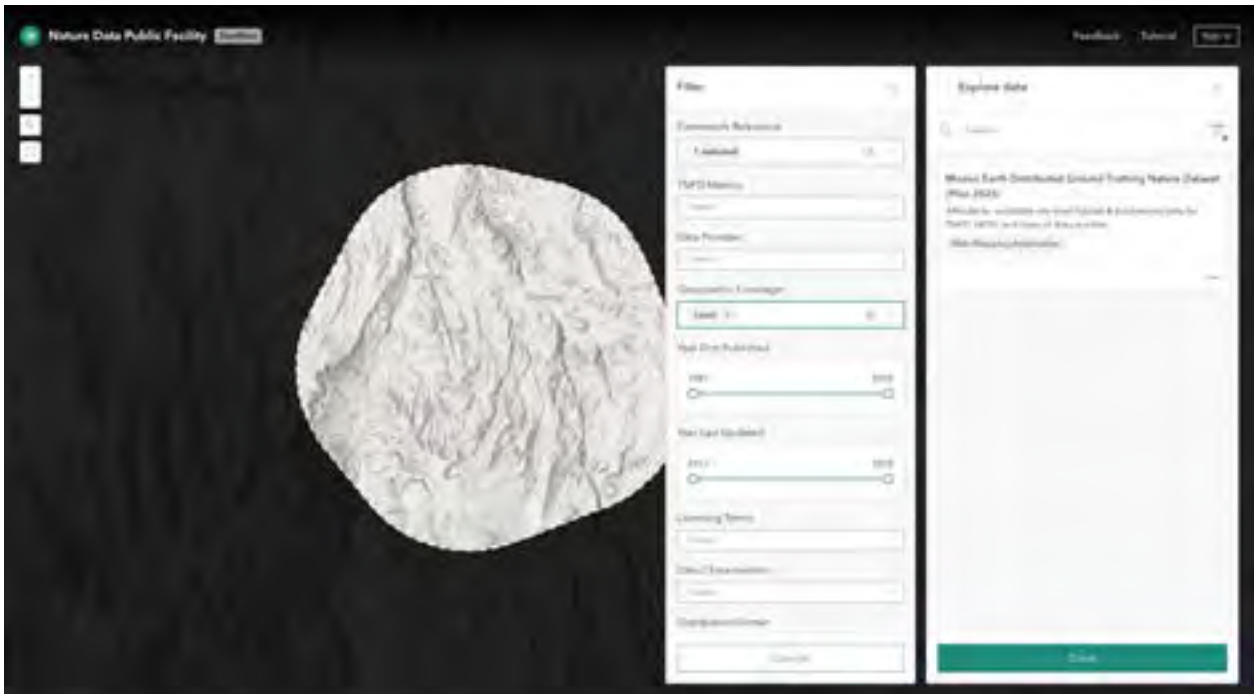


Figure 14: NDPF sandbox with area of interest polygon drawn and focused on, with two datasets toggled onto the map and a legend showing

Figure 15: NDPF sandbox with area of interest polygon drawn and focused on, two datasets toggled onto the map, and summary information about one dataset showing

Figure 16: NDPF sandbox showing part of one dataset's data principles declaration

Proposed commercial model and governance arrangements for the NDPF

Proposed governance arrangements

The NDPF has been designed to be self-financing after an initial launch and scaling phase so that it is not dependent long term on grant funding from government or philanthropic sources. While operating as a commercial entity to ensure its long-term financial viability, it is critical that it operate within a public interest mandate. As such, it is proposed that the facility be operated as a commercial operational subsidiary of, and fully owned by, a not-for-profit international Nature Data Trust as proposed in Recommendation 6 below.

Further details of the proposed governance design and arrangements for the Nature Data Trust are outlined below. Subject to further legal and tax advice prior to launch, the NDPF would likely be an operating entity wholly owned by the Nature Data Trust with its own operating company board including representatives from the trustees of the Trust as well as independent board directors.

It is recommended that the board and management team of the NDPF have full responsibility for the operation of the facility but require the approval of the Nature Data Trust when setting fees and charging both upstream data providers and downstream data users to ensure its commercial objectives remain aligned to a public interest purpose.

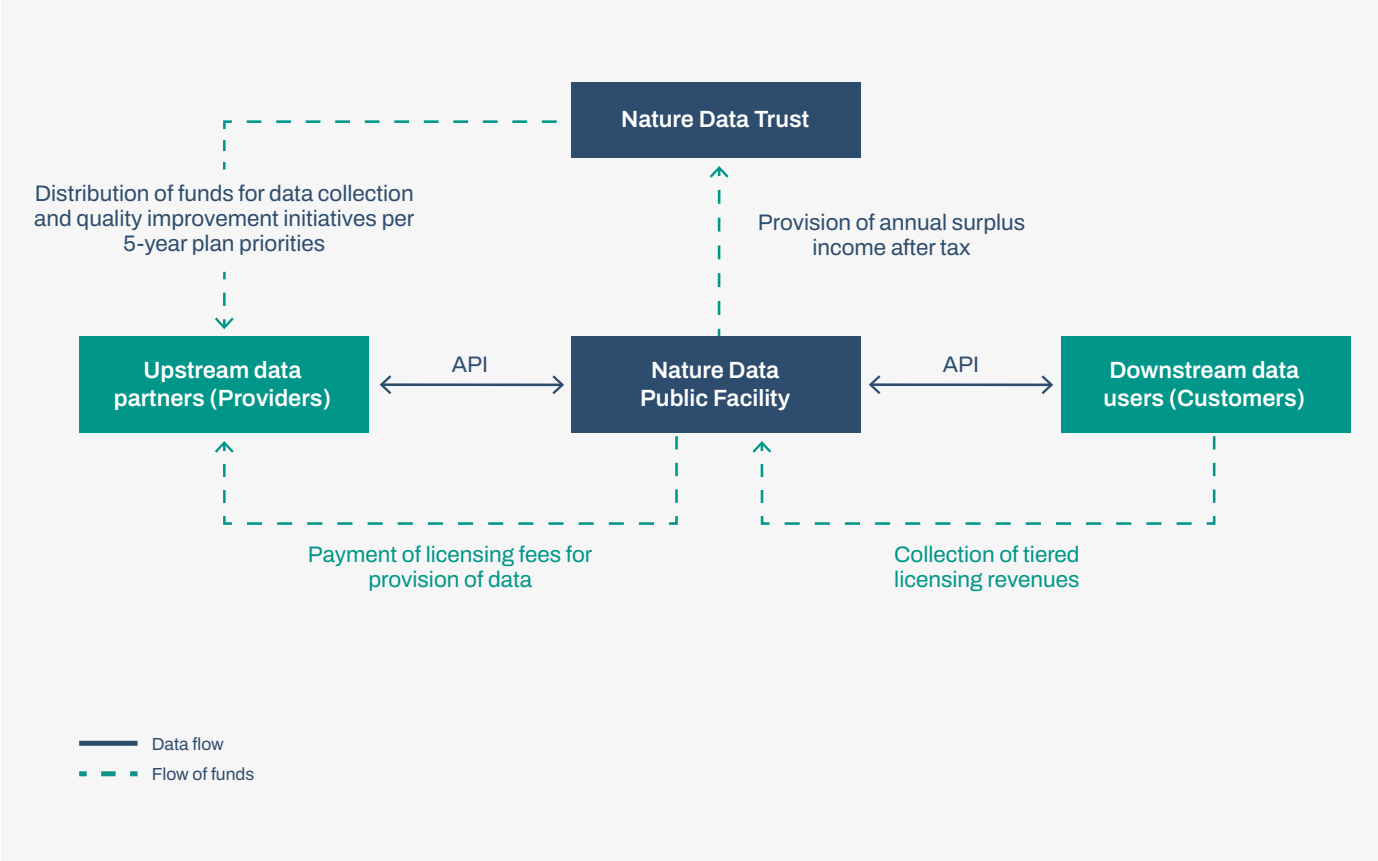
Proposed commercial model

The design of the facility would result in the following core financial flows in and out of the NDPF:

1. The Facility would receive fee income from large and medium sized downstream data users based on the tiered pricing and licensing model outlined above. Small and micro end-user organisations of less than 50 employees and <USD 2 million revenue would be cross-subsidised by the fees earned from larger users so that data is able to be provided to them at no cost;
2. The facility would make payments to data provision partners upstream based on licensing agreements in place with each data provision partner. This would include the facility charging a commission on the provision of data to help pay for the Facility's operating expenses;
3. Surplus funds at the end of the financial year (net profit after tax) would be transferred to the Nature Data Trust. In accordance with the priorities outlined in a five-year nature data value chain investment plan (see Recommendation 6), these funds would then be disbursed by the Trust to data providers as grant funding to support additional data collection efforts and to support quality enhancement initiatives across the nature data value chain.

'The proposed commercial model for the NDPF would involve fee income from large users enabling free, open access for SMEs'

Figure 17: Data and financial flows associated with the operation of the NDPF



Financial viability testing

To test the financial viability of the commercial model outlined above, the TNFD benchmarked a range of plausible and conservative assumptions and modelled the financial profile of the proposed NDPF between 2026 and 2040 (assuming start-up funding is secured to enable a commencement of operations in 2026 as year one).

Based on this testing and the assumptions outlined below, the NDPF would:

- Break-even in Year 3 (2028);
- Pay contributing data providers licensing fee revenues of USD 30.8 million per annum by 2030; and
- Generate surplus funds of USD 2 million per annum by 2030 for the Nature Data Trust to invest across the nature data value chain through data collection partners in additional data collection, aggregation and quality enhancement initiatives.

The modelling assumptions to test the financial viability of the proposed commercial model are highlighted below.

Box 2 – Modelling assumptions

- Forecast of 1,200+ paying organisations by 2040, based on current public adopters and reporters of the TNFD and SBTN
- Users access and license data updated every 2-3 years depending upon their profile
- Initial capex for the technical build of a Minimum Viable Product of USD 6.2-9.5 million, considering both build and integration costs and depreciated over 5 years
- Operating expenditure (OpEx) includes platform costs, data processing, hosting, customer support, sales/marketing, and administration and is projected at 32% of pass-through revenue during the incubation and scale-up phases (years 1–2), declining to around 15% by 2030 as efficiencies and economies of scale are realised

Moving to action – implementing these recommendations

Based on the blueprint and financial viability testing outlined above, the TNFD intends to commence discussions with government and philanthropic funders to seek funding for the creation of the Nature Data Trust and the launch of the NDPF. As outlined above, the NDPF will take three to five years to reach breakeven and create the basis for its long-term financial self-sustainability. It will therefore need to be seed funded by governments and philanthropic partners for its first five years of operation.

Should funding be secured, the legal identity of the Trust would be established and a group of Trustees appointed to take forward the NDPF initiative under its authority.

Box 3: The role of national institutions in South African National Biodiversity Institute (SANBI)

In this age of accelerating data collection and access, the nature data ecosystem in all nations is growing in size and complexity. Making sense of this body of information and ensuring that it is used for responsible environmental decision making and planning is a central tenet of the South African National Biodiversity Institute (SANBI). The Institute is linked to the ministry of environment and plays a key role in facilitating, curating and sharing biodiversity related information, promoting research, and coordinating monitoring and planning.

SANBI is mandated to report on the state of biodiversity and to provide biodiversity data to a range of users and has set up platforms and processes to deliver these.

The pathways to share information with national, provincial and municipal environmental authorities, the environmental impact industry and conservation organisations are well established. So too are the channels for using nature data in reporting against international multilateral agreements such as the Kunming-Montreal Global Biodiversity Framework of the UN CBD.

However, a major gap remains in understanding the needs and capacity of financial institutions and corporates. The Nature Data Public Facility pilot has provided an opportunity for SANBI to gain a better understanding of the biodiversity data needs related to corporate and financial disclosures. The National Biodiversity Strategy and Action Plan (NBSAP) review process has also led to new engagements with Business Unity South Africa (BUSA) to gain a better understanding of nature-related disclosures.

In response, the Institute will aim to expand existing data sharing platforms to serve this emerging need and co-develop new and emerging biodiversity related indicator workflows. The Institute also plans to explore opportunities to add information, gathered by the corporate and financial sector, to the national biodiversity information system.

Recommendation 5 – Incentivise corporate nature data exchange

Accelerate and expand mechanisms and incentives for companies and financial institutions to contribute state-of-nature data they have collected back into the global commons as a recognised and valuable contribution to global policy goal to halt and reverse nature loss.

Context

While most organisations are unfamiliar with the use and interpretation of state-of-nature data and rely exclusively on scientific expertise and data from third-party sources, there are companies in several sectors – such as forestry, mining, energy, agriculture, pharmaceuticals and fishing – with considerable in-house science and conservation expertise. Many also have considerable corporate data on the state of nature in and around the sites in which they operate. In some cases, this data has been collected over decades for the purposes of project or site-specific regulatory approvals, such as environmental impact statements (EIS), or has been collected as part of engagement activities with local stakeholders to support corporate social responsibility (CSR) or sustainability reporting.

Much of this data, collected at considerable expense and with great care, is often used only once. In other cases, many companies operating in the same area, such as a watershed, will collect similar data on a proprietary basis – resulting in unnecessary costs and inefficiencies. In both cases, the potential public value of this privately collected data is an opportunity lost.

Insights from pilot testing

Throughout the Taskforce's engagement on data-related challenges, many corporates have indicated a strong willingness to contribute their nature-related data to the public domain provided appropriate safeguards are in place. However, they have emphasised the absence of clear mechanisms for public data sharing and noted a lack of government or NGO counterparts with the interest, mandate or capacity to receive and steward such data. The TNFD has been investigating practical pathways to facilitate these contributions, enabling high-quality corporate nature data to enhance the global commons. Making this feasible will require robust governance, well-defined data sharing and quality standards, and the development of effective incentive structures.

- Surveys, interviews and a dedicated Corporate Nature Data Roundtable conducted by the TNFD in April 2025 indicate a growing willingness among corporates to share

their state-of-nature data, particularly when clear governance, incentives and safeguards are in place.

- Of those surveyed, 62% of corporates reported that their organisations had invested directly in generating new state-of-nature data.
- Corporate participants highlighted alignment with global goals such as the Kunming–Montreal Global Biodiversity Framework (GBF) and national biodiversity strategies (NBSAPs) as a key motivation for data sharing.

From the interviews with corporates generating their own state-of-nature data, a number of barriers to participation have been clearly identified. These include the lack of commercial incentive to do so; legal complexities associated with data control and data rights, including insensitive areas; concerns about misuse in competitive contexts; and data compatibility challenges.

Nevertheless, practical examples demonstrate that shared data principles (as proposed in Recommendation 1), structured governance, and regulatory requirements and incentives can accelerate participation.

- The Global Biodiversity Information Facility (GBIF) has shown that transparent frameworks and recognition mechanisms can successfully motivate businesses to contribute biodiversity data.
- Similarly, the Western Australian Biodiversity Science Institute (WABSI) has built a trusted infrastructure for corporate data sharing under stringent regulatory and operational conditions – illustrating that when clear rules, technical standards and compliance pathways exist, companies are willing and able to participate.
- Norway stands out as a country noted for enforcing private sector data sharing, particularly from its oil and gas companies, through the Norwegian Environmental Monitoring Database (MOD).

> *"We believe that [corporate nature data sharing] is extremely useful for achieving GBF objectives and supporting NBSAPs, especially in the Brazilian context. Given Brazil's megadiversity, the structured exchange of information between different sectors is essential to promote more granular, contextualised and robust analyses, capable of transforming the large amount of data generated into valuable inputs for more effective decisions aligned with global objectives for nature."*
>
> Sustainability manager, Brazilian forestry company

Box 3 – GBIF's success in enabling corporates to share their nature data

The Kunming-Montreal Global Biodiversity Framework (GBF) agreed in 2022 has raised expectations for businesses to align to the global goal to halt and reverse biodiversity loss by 2030. GBIF – the Global Biodiversity Information Facility (https://www.gbif.org) – is playing a novel role in enabling a growing number of corporates to increase their positive impacts on nature by openly sharing biodiversity data through its international network and infrastructure.

As of October 2025, 120 businesses from 24 countries have published over 1,000 datasets to GBIF. Drawn largely from field surveys for impact assessments and ongoing biodiversity monitoring, the 11 million occurrences they contain provide location-specific records of where and when any species are found on Earth. By participating in this unique form of corporate nature data exchange, early adopters reduce the fragmentation of nature-related data and contribute toward progress on GBF Target 21 to ensure the accessibility of the best available biodiversity data to decision makers, practitioners and the public.

Among the member countries that power GBIF's network, Colombia has had the greatest success in supporting corporate nature data exchange. SiB Colombia (Sistema de Información sobre Biodiversidad) serves as the national node, or focal point, coordinating a robust network of suppliers and users of biodiversity data documenting the country's megadiversity. Central to these efforts has been a joint initiative between SiB Colombia and the National Association of Colombian Enterprises (ANDI), a trade group that represents 1,200 of the country's largest companies. Established in 2020, the Open Data Alliance on Biodiversity from the Business Sector helps ANDI members understand the benefits of data sharing while delivering the training, guidance and technical support needed to share standardised biodiversity data collected through mining, infrastructure, agriculture, forestry and other activities in Colombia.

Colombian businesses have flocked to the programme, having not realised the treasure trove of data they had stockpiled. To date, the 73 companies participating in the Alliance have published more than 600 datasets and more than five million records into GBIF, an addition that has made Colombia the largest provider of data to GBIF in Latin America. New programmes aim to create new trainers in businesses and build on these successes while the GBIF network looks to replicate the approach elsewhere around the world.

Recommendations on unlocking corporate nature data

5a. Provide a trusted architecture to enable corporate nature data sharing and to build awareness of what leading companies are doing and how they are navigating legitimate legal and competitiveness concerns when using Creative Commons and commercial licensing harmonisation (Recommendation 3). This could include a voluntary Nature Data Exchange Charter to address concerns about restricted content/controlled access, commercial sensitivities and risk mitigation (e.g. anonymisation).

5b. Scale up efforts by international actors, such as GBIF, to engage companies across high land/sea/freshwater use sectors and prepare their data for contribution into the global public commons, including through the proposed Nature Data Public Facility (Recommendation 4) where relevant.

5c. Explore and define a commercial value proposition for corporate data sharing, potentially anchored by the concept of an 'exchange', whereby companies that contribute desired state-of-nature data that adheres to nature data standards receive a rebate or credit for use on other data platforms to acquire state-of-nature data they would ordinarily pay to access and license. This could include practical guidance on data sharing and sector-led collaboration to secure and support participation at scale.

Moving to action – implementing these recommendations

If funded and launched, the Nature Data Public Facility has the potential to serve as a major enabler for corporate contribution and exchange of state-of-nature data. Organisations with the capacity to meet the facility's inclusion criteria could provide data directly, while others could participate via data aggregators. In doing so, the NDPF would support broader uptake of a core set of nature data principles (Recommendation 1) and common metadata standards (Recommendation 2), strengthening harmonisation and best practice across the global nature data ecosystem.

Recommendation 6 – An international Nature Data Trust

Establish an independent international not-for-profit organisation, in the form of a data trust, to generate and redistribute funding for long-term strategic investment in state-of-nature data collection and quality enhancement initiatives across the nature data value chain. This organisation would operate the proposed NDPF (Recommendation 4), consistent with the global nature data principles, metadata standards and common licensing and user agreements (Recommendations 1, 2 and 3) and encourage corporate nature data exchange through the facility (Recommendation 5).

Context

As outlined in this report, high-quality, decision-useful, state-of-nature data is vital for scaling business and finance action to contribute to nature-positive outcomes. Nevertheless, with public finances around the world under increasing pressure from a multitude of competing demands, there is a significant risk that the strategic significance of state-of-nature data as a global commons asset will be overlooked and remain underfunded. This will act as a significant barrier to action against other global policy goals, including the achievement of the goals and targets in the Global Biodiversity Framework. This includes Target 15 calling for corporate reporting of nature-related dependencies, impacts and risks. Further national government funding and multilateral donor funding remains critical but is not assured, so new modalities for generating long-term funding for investment in state-of-nature data are urgently needed.

Recommendations on financing state-of-nature data

6a. Place a revenue-generating Nature Data Public Facility (Recommendation 4) under the authority and oversight of a public interest supervisory board – a Nature Data Trust – with international status. That same entity could also provide the whole-of-value-chain coordination called for to adopt the nature data principles (Recommendation 1), develop a global framework for metadata (Recommendation 2) and encourage harmonised licensing arrangements across the nature data value chain built on open data standards as a foundation (Recommendation 3).

6b. Develop five-year, state-of-nature data investment plans, under the authority of the Nature Data Trust, with a whole-of-value-chain perspective to direct funding into priority data collection and aggregation initiatives.

Recommended governance arrangements

The Nature Data Trust should be an international not-for-profit entity led by a Board of Trustees drawn from government, philanthropy and standard setting organisations. The Climate Data Steering Committee (CDSC) overseeing the Net Zero Data Public Utility (NZDPU) with respect to climate data is an example of the type of board composition that would provide global leadership and independence.

Recommended mandate for the Nature Data Trust

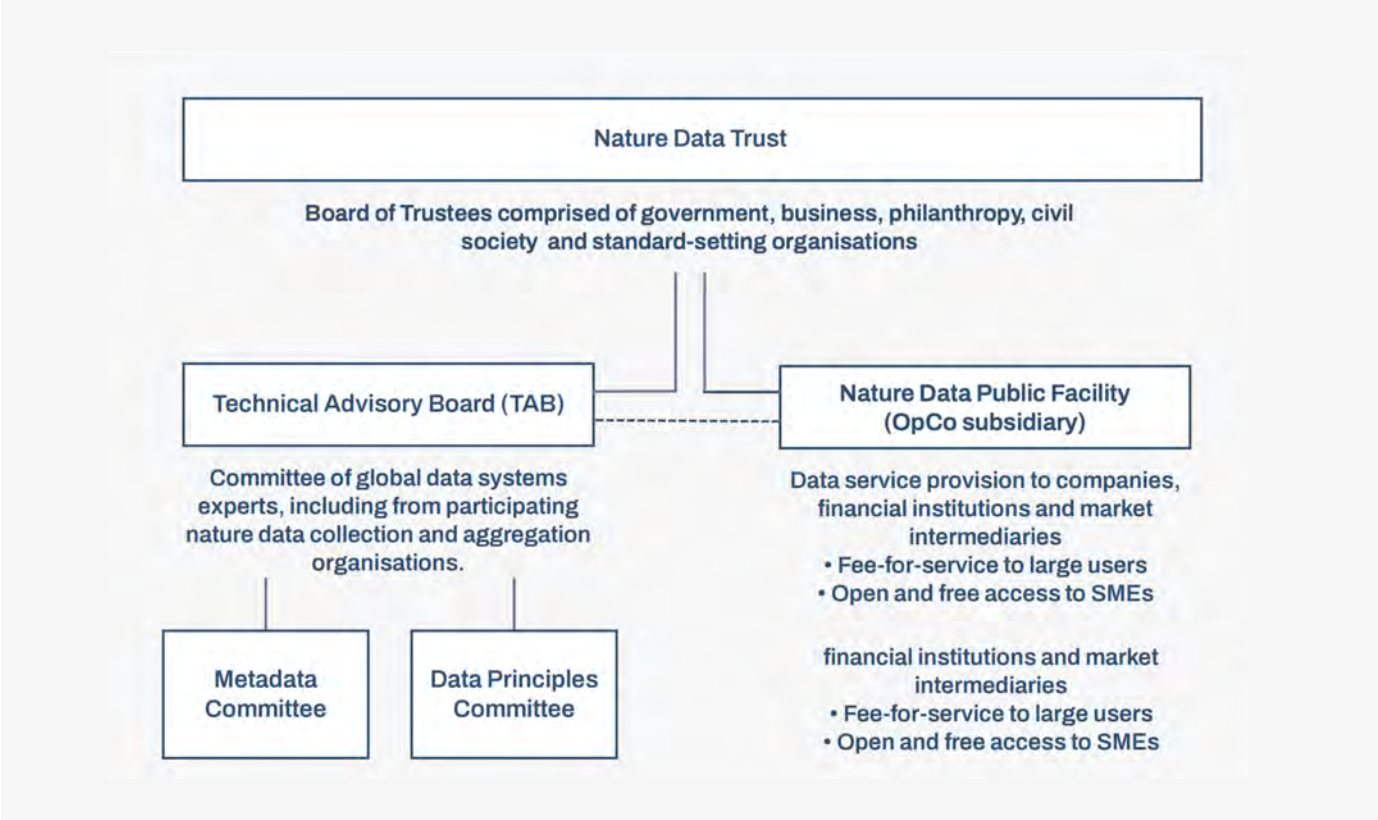
Aligned to the recommendations outlined in this report, the scope of responsibilities for the Trust as a global commons institutions for the benefit of the whole nature data value chain and stakeholders invested in its long-term resilience, could encompass the following:

1. Uphold and promote the nature data principles (Recommendation 1);
2. Operate the NDPF as a revenue-generating entity to produce funds for reinvesting strategically into the long-term upgrade of the nature data value chain (Recommendation 4);
3. Develop five-year nature data value chain investment plans to identify and prioritise data collection initiatives for funding and quality improvement interventions along the value chain (such as Recommendation 2c. to develop and deploy a nature data identifier); and
4. Periodically review and update the nature data principles, metadata framework and common licensing standards (Recommendations 1, 2 and 3) through a technical advisory committee and multi-stakeholder review process, perhaps every three to five years.

Organisational components to deliver this mandate

In addition to the Board of Trustees, it is proposed that the Trust oversee two organisational elements: first, the Nature Data Public Facility as a commercial operating subsidiary; and second, a Technical Advisory Committee that meets on an occasional basis to review and advise the Trust on revisions to the data principles, metadata framework and common licensing standards. The Technical Advisory Committee could also provide input into the identification of investment priorities for the five-year value chain investment plans.

Figure 18: Proposed Nature Data Trust and subsidiary entities and committees



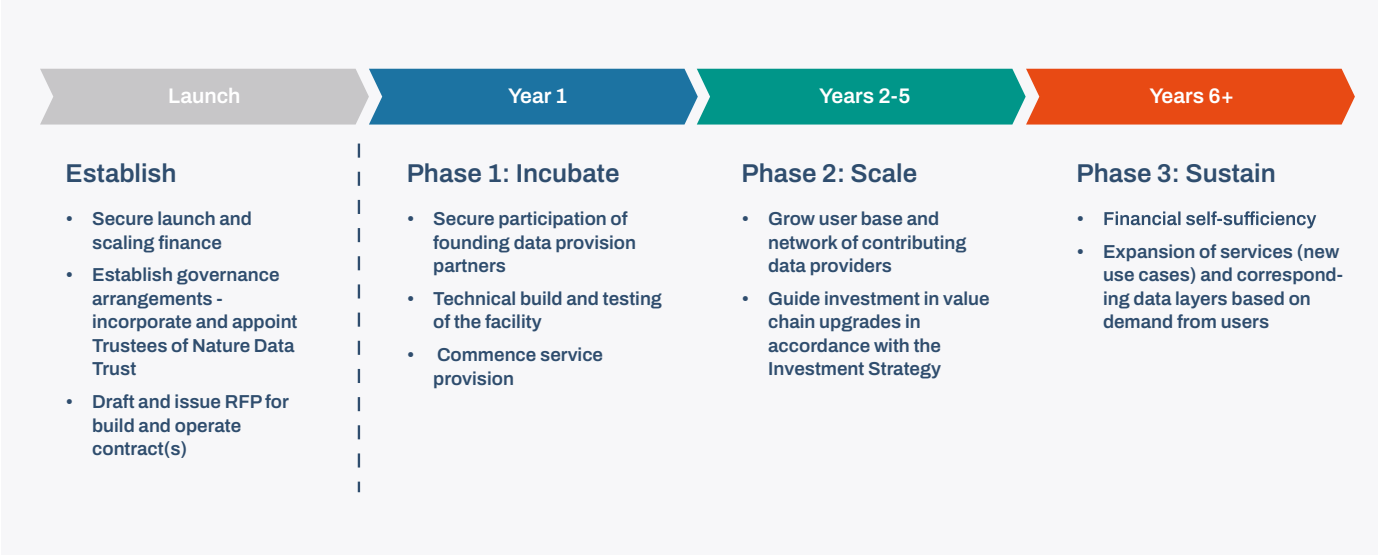
Financing the activities of the Nature Data Trust

As outlined in Recommendation 4 above, the costs associated with running the Trust, including the operation of the NDPF and costs associated with convening Technical Advisory Committee members, would be covered by the income earned from data licensing fees charged by the NDPF. As outlined above, the NDPF is expected to breakeven in year three of operation, highlighting the need for the launch and scaling of the Trust and its activities for the first five years to be funded through government and philanthropic grant funding.

Moving to action – implementing these recommendations

The illustrative timeline below outlines how the Nature Data Trust and the NDPF initiatives could be advanced together. In the short term, the TNFD will work with other key partners to develop and present a funding proposal to government and philanthropic funders for the Nature Data Trust and the NDPF and, if requested, support the incorporation of the Trust entity and selection of Trustees if funding is secured.

Figure 19: Indicative timeline for the Nature Data Trust and NDPF to launch and scale



Recommendation 7 – Nature measurement protocol

Support standardisation and consistency of nature-related measurement for the benefit of companies and financial institutions by establishing an international, cross-sector initiative to develop globally applicable, science-based standards for how to measure and account for nature-related impacts and dependencies. This could be modelled on, and learn from, the GHG Protocol for measurement of GHG emissions.

Context

A range of frameworks, standards, regulations and initiatives have emerged to guide what businesses and financial institutions should assess and report for their nature-related dependencies and impacts. These include the TNFD, the Science Based Targets Network (SBTN), the Global Reporting Initiative (GRI), the International Sustainability Standards Board (ISSB), ISO, the Corporate Sustainability Reporting Directive (CSRD), the Capitals Coalition and the Nature Positive Initiative (NPI). These consistently set out *what* to measure, but do not fully set out *how* to measure, value and account for nature-related dependencies and impacts. This presents a fundamental gap that impairs organisational decision-making and risk and opportunity management.

Findings from market feedback

In early 2025, the TNFD, NPI, Capitals Coalition and World Business Council on Sustainable Development (WBCSD), with technical advice from the World Resources Institute (WRI) based on their experience of the GHG Protocol, conducted a series of informal market soundings to assess whether a nature measurement protocol might be useful, and if so, what it might include and how it might be developed. This involved interviews with 24 market participants and a review of 18 related frameworks and standards. The results of this early market scoping confirmed that there is a need and desire to address this key measurement methodology gap in the global architecture for nature-related metrics and data. Market participants confirmed their desire to see consistent, practical guidance developed on how to measure nature-related impacts and dependencies encompassing elements of impact and dependency pathways, including impact drivers, state-of-nature and ecosystem services.

The lack of detailed measurement methods is a barrier to effective performance management, disclosure, target tracking and investment in nature. A Nature Measurement Protocol would fill this gap by:

- Providing market participants with clear, consistent guidance that aids comparability;
- Enabling scientifically credible and practical measurement by businesses and financial markets; and across sectors and geographies; and
- Supporting delivery of global and national goals including the Kunming-Montreal Global Biodiversity Framework (GBF).

Recommendations for a nature measurement protocol

7a. Formation of an international, cross-sector initiative – including representation and participation from scientific, conservation, business, finance, civil society, standard-setting communities and Indigenous Peoples – to develop a globally applicable, science-based method for the measurement of nature-related dependencies and impacts. This could be modelled on the GHG Protocol for measurement of GHG emissions.

7b. Determine priority use cases to inform the development of detailed criteria to assess the relevance of nature data. The use cases should enable the development of technical guidance on data specifications (e.g. timeliness of updates) aligned with existing initiatives such as the Nature Positive Initiative (NPI).

Moving to action – implementing these recommendations

The TNFD will encourage other interested and suitably experienced international partners to lead this initiative and provide technical support and input.

Recommendation 8 – A universal digital protocol for sharing nature data across value chains

Respond to the costs and complexities associated with collecting and sharing sustainability data across supply chains (particularly the burden on SMEs facing information requests from multiple downstream customers) by encouraging the development of a standardised global digital protocol for sharing climate and nature-related impact and dependency data (output data) from one company to another.

Context

Efficient, transparent and interoperable exchange of nature – and climate-related organisational data across supply chains – is a critical enabler of effective supply chain risk and resilience management and corporate reporting of nature-related dependencies and impacts in corporate value chains (akin to scope 3 reporting of emissions). Nevertheless, value chain data sharing is hindered today by a lack of alignment around what nature-related dependencies and impacts to measure, how they should be measured consistently, and how that information can be shared in a consistent, seamless way among value supply chain partners, with insurance and credit providers, and for regulatory reporting purposes. Through the TNFD's market consultations over the past four years, companies and financial institutions have expressed significant frustration about fragmented, inconsistent data requests; confidentiality concerns acting as a barriers to information sharing; and a lack of basic technology and data sharing protocols to save the time and cost associated with responding to bespoke data questionnaires and surveys from different stakeholders. These impacts are particularly acute for SMEs, who often lack the resources, clarity or incentives to respond to a proliferation of unaligned information demands.

While a range of data sharing tools and apps currently exist in many global supply chains to help facilitate better data sharing, these are typically developed on a bespoke basis for a specific supply chain. Interviews by the TNFD with market participants suggest an opportunity to develop and scale a universal data sharing protocol as a universal cross-sector and cross-platform facilitator of more consistent, seamless data sharing among value chain partners. This would also help facilitate data aggregation by data recipients using machine readable technologies to support analytics for supply chain management and corporate reporting. Solutions would need to consider data ownership, information security and permission-based exchange to satisfy confidentiality concerns.

Learning the lessons from the ubiquitous deployment of data sharing protocols such as Bluetooth, Wi-Fi and QR codes, candidate solutions could be identified, tested and developed by a cross-sector industry consortium leveraging the support of a number of technology partners. The consortium could consider the best pathway for ubiquitous cross-sector adoption, including development and release on an open source, open license or royalty-free basis.

Recommendations on a digital protocol for sharing supply chain data

8a. Encourage collaborative, cross-sector prototyping of a universal data sharing protocol for climate and nature-related dependency and impact data between organisations. Identify and test lightweight, permission-based universal formats (e.g. QR-code or API-linked passports) that allow suppliers to securely share validated information with customers, insurers and capital providers while retaining control of sensitive data.

8b. Align on required metadata schemas, open APIs and governance principles that enable data portability and aggregation across existing supply chain traceability technology solutions and platforms rather than creating a new proprietary protocol or platform.

Moving to action – implementing these recommendations

Such an initiative could be started by a broad-based business consortium focusing on a small portfolio of dependency and impact metrics for pilot testing. The TNFD would recommend starting with the nine 'core' dependency and impact metrics identified by the TNFD in its 2023 recommended disclosures with the inclusion of CO2e as a 10th metric to provide coverage of both climate (emissions) and nature-related related dependency and impact metrics. Together, these 10 metrics cover four out of the five drivers of change identified by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES); namely, climate change, land/sea/ocean use change, resource use and pollution. The TNFD and a range of partners are currently examining potential metrics for the fifth driver of change – invasive alien species – with the hope of releasing a recommendation in 2026.

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Appendix A: Nature data principles (v1.0)

Further to information provided in Recommendation 1, the table below provides further detail about the seven nature data principles (v1.0) proposed by the TNFD and the supporting 20 criteria or proof points proposed to evidence satisfaction of each principle.

Table 7: Proposed nature data principles and associated evidence criteria

1. Transparent and Reproducible **Provide a clear and accurate summary of the available data, including methodologies, assumptions and processes used in data collection and processing, and any resulting limitations in data quality, coverage and applicability – to support understanding and reusability in line with the FAIR Guiding Principles.**	1.1	Is the dataset accompanied by publicly available metadata that describes, at a minimum, the: • Dataset's origin, and the source of any input data used • Methodologies, estimations and assumptions used to produce the data • Processing code, algorithms or scripts used to produce the data • Dataset coverage (including geographic and temporal scope) • Limitations in data quality and applicability • Efforts made to identify and address key biases
	1.2	Is the dataset and metadata presented in a way that is easy for users to understand and navigate?
	1.3	Are datasets timestamped and version-controlled, with modification history documented (e.g. change logs, version numbers, DOIs/ UUIDs) that enables identifying when changes were made and by whom?

2. Credible **Provide documentation that demonstrates the data has been prepared by a competent, capable and trustworthy source recognised as having authority, and is managed under clear governance policies to support reliability of the data.**	2.1	Is the data prepared by a source that has relevant experience and expertise (including traditional knowledge) of the phenomenon represented and the methodology used?
	2.2	Has data been prepared in line with appropriate scientifically accepted or widely applied methodologies (including traditional knowledge) relevant to the subject matter?
	2.3	Are there data governance processes in place to ensure that the dataset: • Has been approved for publication by an appropriately authorised individual or body, and; • Has not been altered without appropriate authorisation?
	2.4	Have efforts been made to identify and disclose potential conflicts of interest or independence biases for individuals involved in dataset creation?
3. Accurate and Complete **Provide transparency about the data quality and the level of accuracy and completeness to help guide users in its interpretation and use. Put processes in place to identify and address any errors within the dataset, including redress mechanisms to support trust and accountability in the event of misrepresentation.**	3.1	Are there quality controls or checks in place to detect and address errors in the dataset, before and after it is published?
	3.2	Has the data undergone a process of external review or validation such as peer review or independent assurance?
4. Relevant and Decision-useful **Provide information for the user to understand how the data meets the specifications for the use case for which it is recommended and can support purposeful decision-making and analysis by the user.**	4.1	Does the supporting information clearly define how the dataset is intended to be interpreted and used, including its relevant spatial and temporal scales and any nature metrics it may support?
	4.2	Is there a process in place to update the dataset regularly enough to ensure it remains representative and useful for the intended use?

5. Accessible and Usable **Ensure data is findable, retrievable, understandable and usable for the broad community of users by minimising unnecessary access restrictions – in line with FAIR Guiding Principles for Findability and Accessibility – and incorporating user feedback and support mechanisms to guide data use and continual improvement.**	5.1	Are the dataset, metadata and source data accessible online in open-access formats that are both human and machine-readable, with minimal restrictions except where necessary to uphold legal rights or prevent harm?
	5.2	Is there a process for data users to ask questions or request additional information to interpret and use the dataset?
6. Ethics and Privacy Protection **Uphold ethical standards in data collection and sharing by respecting individual rights, collective benefits, legal frameworks, licenses and Indigenous data sovereignty. This includes implementing controls to protect data integrity and avoid harm to biodiversity or communities involved in data collection and governance, in line with CARE Principles for Indigenous Data Governance.**	6.1	Has the data provider established and documented clear processes to respect rights and safeguards in relation to sensitive or community-linked data, including (where such data is used) obtaining Free, Prior and Informed Consent in line with the CARE Principles for Indigenous Data Governance?
	6.2	Where relevant, has the creation and publication of this dataset been evaluated for the potential impacts (positive and negative) to indigenous peoples, Local Communities and sensitive ecological areas?
	6.3	Are the legal rights of data users and providers clearly communicated using machine readable, standard licence terms (e.g. Creative Commons, Open Data Commons)?
	6.4	Is there documented commitment for the dataset to maintain and improve alignment with CARE Principles for Indigenous Data Governance?

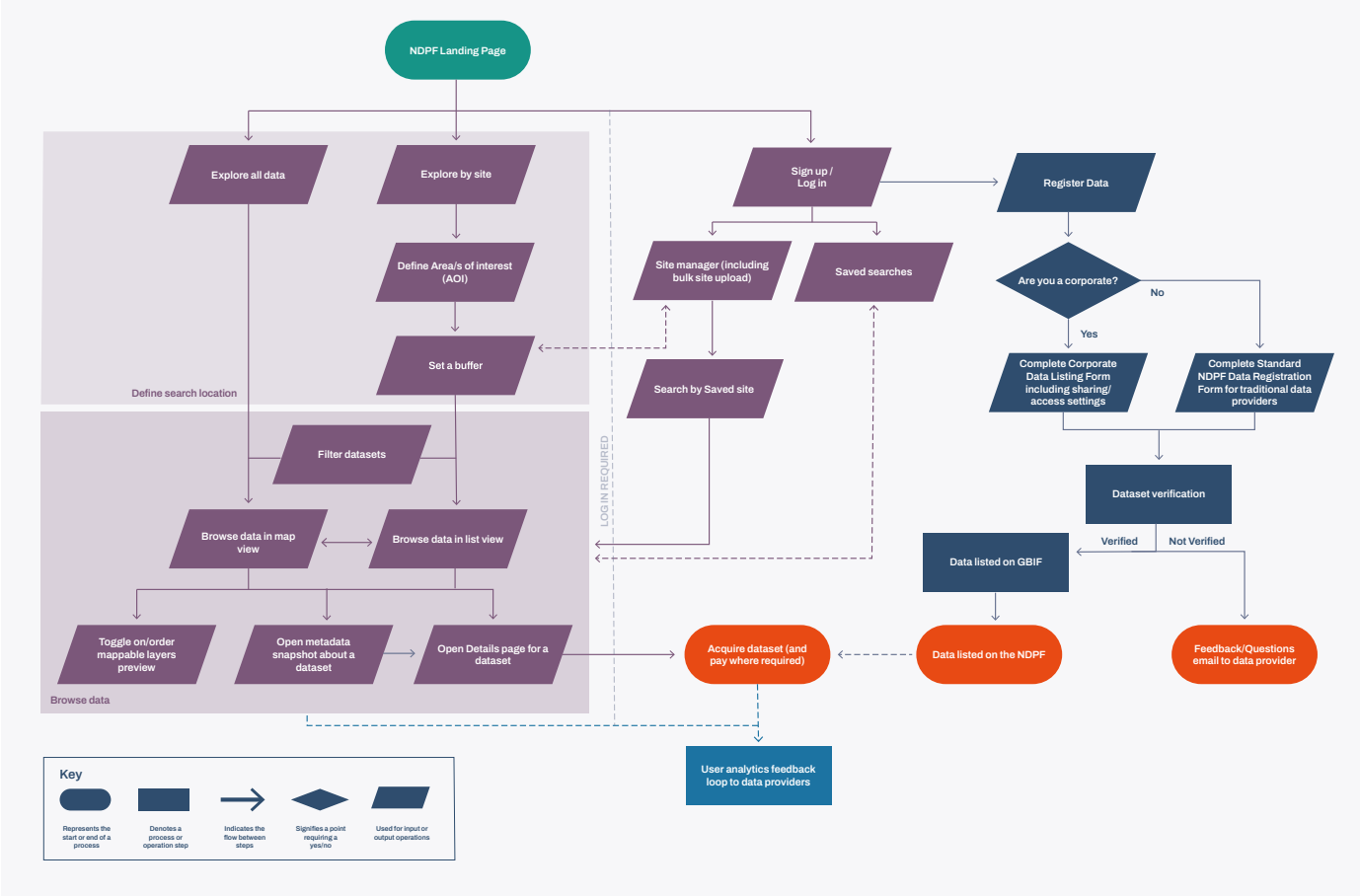
Networked and Compatible: **Design data to be interoperable and compatible with other datasets and platforms, ensuring it can be easily discovered, and linked and integrated across systems in line with the FAIR Guiding Principles for Interoperability.**	7.1	Is the data prepared using recognised open standards for data, taxonomies or classifications (e.g. SASB standards, IUCN Global Ecosystem Typology, ISO Data Standards, Darwin Core) that support interoperability and comparison across datasets?
	7.2	Can the data be easily found, accessed and used without needing to be stored in one central location (e.g. via APIs, metadata harvesting or federated query systems)?
	7.3	Are there mechanisms—such as identifiers, URIs, linking services, crosswalks, or harmonisation notes—along with documentation that enable users to connect the data to other related data for cross comparison, analysis and aggregation?

Annex B: NDPF technical design summary

Building on Recommendation 4, additional details are outlined below as a high-level technical design for the NDPF. This would provide the basis for commissioning the detailed design, build and operationalisation of the NDPF by the Nature Data Trust through a Request for Proposal process as recommended above.

NDPF data provider and data user workflows

Figure 19: User workflows and data flows



Technical specification: Component view to support workflows

Figure 20: The figure illustrates the capabilities in the logical architecture proposed for the NDPF.

Component catalogue

The following provides an outline of the key components required to deliver the NDPF's (upstream and downstream) workflow requirements.

Experience and client interfaces:

1. Web Application (SPA: React/Map UI)
2. Analyst/Consultant Workspace (projects, advanced export)
3. API Consumer Interface (developer portal, API tokens)
4. Provider Console (onboarding, pricing/licensing)

Edge and security:

5. API Gateway and Web Application Firewall
6. Authentication/Authorisation Service (OIDC/OAuth2, SSO)
7. Role-Based Access Control
8. Entitlements Service (license scope/expiry enforcement)
9. Event Bus (publish/subscribe) & Notification orchestration
10. Rate Limiting & Throttling Module

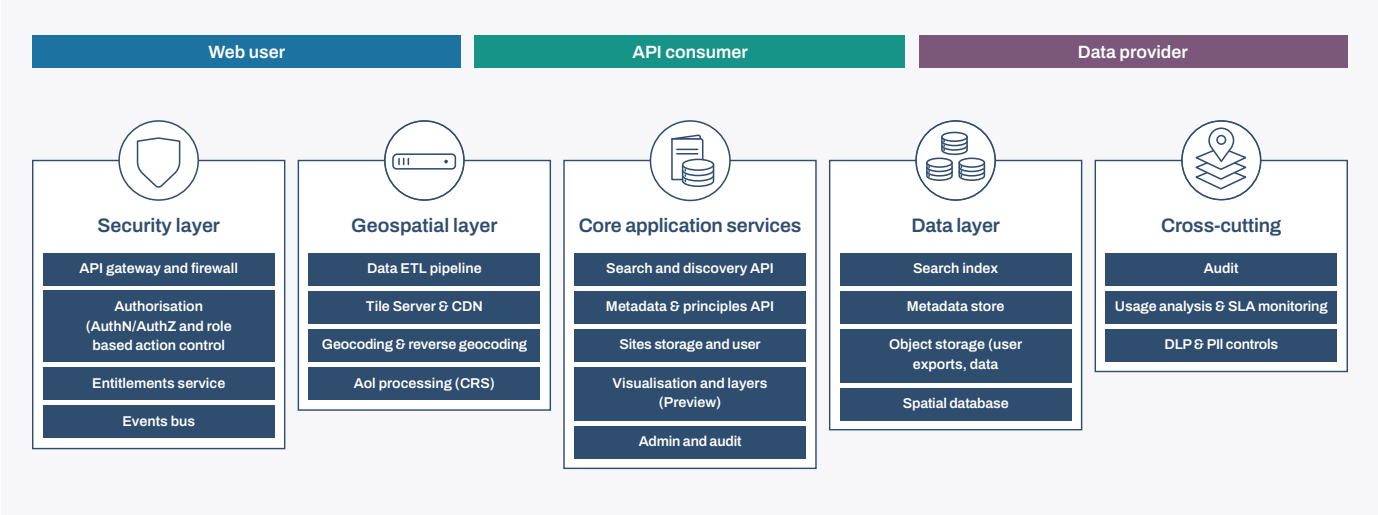
Core application services:

11. Search & Discovery API
12. Metadata & Taxonomy Service (Schema/Metadata Registry)
13. Data Principles Capture & Validation Service
14. Framework Tag Catalog & Mapping Service (TNFD/SBTN/NPI)
15. Sites Service (AoIs, versioning, tagging)
16. Saved Query Store (Saved Searches)
17. Visualisation & Layer Manager (symbology, ordering, opacity)
18. Mappability Classifier (capability flags)
19. Preview Tile Proxy (watermarking, zoom caps)
20. Licensing & Offers Service (catalog/pricing)
21. Purchasing Service (orders, PSP integration)
22. Order Orchestrator (state machine)
23. Delivery & Exports Service (API brokerage, file generation)
24. Admin Console (publish gates, ops tools)
25. Audit & Observability Service (logs, metrics, traces)

Data plane:

26. Search Index (OpenSearch/Elasticsearch)
27. Metadata Store (Database)
28. Spatial Database
29. Object Storage (for provider drops & export artifacts)

Figure 21: The figure illustrates the components in the logical architecture proposed for the NDPF.



Annex C: NDPF financial feasibility assumptions

Further to the financial feasibility analysis for the NDPF and the Nature Data Trust outlined in Recommendations 4 and 6, additional details are provided below about the revenue and cost assumptions underpinning the feasibility analysis conducted by the TNFD with the support of consultants from BCG. It outlines the rationale and financial parameters used to model revenues, OpEx and CapEx.

The following assumptions are based on benchmark analyses and expert perspectives on digital infrastructure projects of comparable scale and maturity. They provide a sound foundation for defining funding tranches, supporting start-up grant funding applications, and guiding strategic investment planning for the NDPF's first five-year rollout.

Revenue assumptions

Revenue is forecasted based on an initial 104 paying organisations in the first year (2026) reaching 1,200+ by 2040. These figures are founded on current public adopters and reporters of the TNFD and SBTN and projected adoption rates.

It is anticipated that users will access and license data every two to three years depending upon the profile of their organisation and use type. Consideration has been given to frequency of use by both market intermediaries and end users.

Pricing and data acquisition cost assumptions

Pricing has been based on existing market prices for the nature datasets offered. The revenue 'pass-through' to data providers has been modeled at an average of 73% of the total price for the dataset with a 'commission' of 27% to the NDPF. Based on this model 'pass-through' to data providers is USD 4.7 million in the first year (2026) rising to USD 71.6 million in 2040. The 'commission' is calculated at USD 1.3 million in the first year (2026) rising to USD 19.5 million in 2040.

Operating expenditure (OpEx) assumptions

The operating cost assumptions represent recurring expenses structured around the key categories of processing, platform management, sales and marketing, and general administration.

Processing costs

Processing costs are assumed to be approximately 2% of pass-through. They capture decentralised data cleaning and harmonisation activities, reflecting the ongoing need to manage data ingestion from multiple sources and ensure consistent data quality. The estimate assumes a lower-end benchmark, given that data providers are expected to proactively align their data to the nature data principles and standards used by the NDPF (Recommendation 1 in this report), reducing the need for additional processing and harmonisation by the NDPF.

Platform costs (data hosting and customer support)

Platform operations and DevOps costs are assumed to be around 4% of pass-through covering maintenance of the technical infrastructure, including system uptime, updates and performance optimisation.

Data hosting is assumed to account for about 5% of pass-through, encompassing cloud infrastructure, API hosting, and data caching services required to ensure a scalable and secure platform environment. These costs should be accounted for under the current hypothesis that the NDPF will not store any data but will work through an API-broker model.

Helpdesk and customer support are also assumed at roughly 5% of operational pass-through, covering technical and functional support for users across onboarding, troubleshooting and ongoing platform operations.

Sales and marketing

Sales and marketing costs and CRM activities are assumed at approximately 6% of pass-through combined, covering outreach, communication and client relationship management.

General and administrative

General and administrative costs are assumed at 10% of pass-through, covering human resources, finance, IT, and legal functions required for governance and operations. This is a conservative estimate and may be adjusted depending on the final governance structure

Overall, these OpEx categories amount to approximately 32% of pass-through[1] during the incubation and scale-up phases (Years 1–2), declining to around 15% by Year 5 as efficiencies and economies of scale are realised.

Specifically, processing and customer support costs (i.e., variable costs) are assumed to grow in direct proportion to pass-through, reflecting their dependence on data volumes and organisation traffic. In contrast, the remaining OpEx components (i.e. fixed costs) described above are expected to increase only in line with inflation after inception phase, estimated at 2% per year.

Capital expenditure (CapEx) assumptions

Capital expenditure assumptions relate to the one-time investment required to commission, build and prepare to launch the NDPF as a Minimum Viable Product.

The total CapEx is estimated between USD 6.2 million and USD 9.5 million divided into two main components:

- Core build costs for the foundational platform development: and
- Integration costs for interoperability and ecosystem connectivity.

Core Build Costs – *Total estimated core build costs: USD 2.9-4.5m*

- System architecture and cloud setup cover the scalable infrastructure, link resolution, API monitoring and monetisation system; and data protection and cybersecurity measures amounting to USD 0.8–1.2m.
- User interface and onboarding portal include advanced UX design with GIS functionalities, accessibility features and interactive onboarding workflows, estimated at USD 1.2–1.8m. This assumes that the platform will be built by customising an existing GIS system rather than developing a new one. The estimate is conservative and does not account for potential discounts that may apply due to NDPF's not-for-profit status.
- The usage metering module supports API usage tracking, user-activity monitoring and generation of consumption analytics estimated at USD 0.5–0.8m.
- Registry module enables metadata management, cataloguing and export functionalities, ensuring all datasets hosted on the NDPF are properly documented, traceable and interoperable, at an estimated set-up cost of USD 0.4–0.7m.

Integration Costs – *Total estimated integration costs: USD 3.3-5m*

- API gateway and connector architecture to enable secure and efficient data exchange between NDPF and external systems. This includes the development of standardised APIs, data ingestion pipelines and management tools that allow real-time integration with multiple data providers, amounting to USD 0.8–1.2m.
- Middleware integration for workflow engine and business rules covers the setup of a workflow engine to automate metadata validation, synchronisation of data updates and system-triggered alerts, amounting to USD 0.8–1.2m.
- Identity federation enables secure authentication and single sign-on (SSO) capabilities, allowing users to access NDPF using their existing institutional credentials while maintaining compliance with data security and privacy standards, amounting to USD 0.4–0.6m.
- Harmonised data validation setup amounting to USD 0.3–0.5m, supports the enforcement of the nature data standards and metadata requirements (Recommendations 1 and 2), ensuring consistency, accuracy and comparability across data sources.
- Data provider onboarding and connectivity, covers the technical work required to integrate around 30–40 initial data providers into the platform, including connector configuration, validation testing and documentation, estimated at USD 1.0–1.5m.

Annex D: Additional contributors

The Taskforce would like to thank the following additional organisations for their contribution to this report in the form of feedback and participation in focus groups.

- (ARIES) Advanced Research and Innovation Agency
- ABN AMRO
- ANDI – National Business Association of Colombia
- AXA
- BP
- Cecil Earth
- Climate Asset Management
- Colombian Biodiversity Information Facility
- Commerzbank
- Deutsche Kreditbank AG (DKB)
- Das kann Bank
- Dow Chemicals
- EcoPetrol
- European Space Agency (ESA)
- Humboldt Institute – Columbia
- IBGE – The Brazilian Institute of Geography and Statistics
- Kenneth Bagstad
- KPMG
- Little Blue Research
- Maxeda
- MSCI
- Nature-based Insights
- Pivotal
- Planet
- Putnam Investments
- Rabobank
- Reckitt
- Robeco
- S&P
- Sainsburys
- Salesforce
- Swire Properties
- The Biodiversity Consultancy
- The GPT Group
- The Norinchukin Bank
- Western Australia Biodiversity Science Institute (WABSI)

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