Findings of a high-level scoping study exploring the case for a global nature-related public data facility

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Preparation of this scoping study was led by the Taskforce on Nature-related Financial Disclosures (TNFD) with the support of the Global Commons Alliance and input of the Capitals Coalition, CDP, Global Reporting Initiative (GRI), Global Biodiversity Information Facility (GBIF), Open Earth, MRV Collective, Science Based Targets Network (SBTN) and UN Environment Programme World Conservation Monitoring Centre (UNEP-WCMC) with the research and project management support of Nature Finance and Systemiq.

This paper responds to questions from number of G20-member governments about how addressing nature-related data challenges could enable and accelerate the uptake of corporate reporting and target-setting by business and finance, in line with Target 15 of the Global Biodiversity Framework.

About this scoping study

This paper follows a nature data landscape assessment published by the TNFD in March 2022, produced with the support of a network of data providers now assembled as the Nature-related Data Catalyst. That landscape assessment prompted enquiries from governments, corporates and financial institutions to the TNFD about how nature-related data challenges can be addressed to enable and accelerate the uptake of corporate reporting and target setting by business and finance. Interest in global scale solutions to nature-related data challenges have accelerated since the successful agreement of the Kunming-Montreal Global Biodiversity Framework (GBF) at the CBD COP15 meeting in Montreal in December 2022.

The growing importance of high-quality, consistent nature-related data

The agreement of the GBF has created unprecedented momentum to address the impacts and risks of accelerating nature loss globally. In Montreal, almost 200 countries agreed to "halt and reverse" nature loss by 2030. This means national efforts to upgrade National Biodiversity Strategies and Action Plans (NBSAPs)[1]. And it means businesses and financial institutions will be expected to monitor, manage and disclose nature-related impacts, dependencies and risks, in line with GBF Target 15.

At the same time, interest and momentum among governments and private sector actors in the design and financing of scalable nature-based solutions (including nature-based climate solutions) is growing rapidly. Nature's assets, and the ecosystem services they provide, are the foundations of our economies and societies and their resilience is critical to meet climate targets and sustainable development goals, such as ensuring food security. Yet, there is a significant nature financing gap, which urgently needs to be closed. The 2022 UN State of Finance for Nature report concluded that finance flows to nature-based solutions (NbS) are currently US$154 billion per year, less than half of the US$384 billion per year investment in NbS needed by 2025, and only a third of investment needed by 2030 (US$484 billion per year) to limit climate change to below 1.5°C, halt biodiversity loss and achieve land degradation neutrality.[2]

The availability of accurate, comparable and decision-useful nature-related data is an essential pre-requisite to address the global challenge of accelerating nature loss, to help organisations become more resilient in the face of nature-related risks, to deliver sustainable development for local communities, and to facilitate the flow of capital to nature positive outcomes.

Following the agreement of the GBF in Montreal, governments everywhere require better quality nature-related data to inform their policy settings and actions, including the preparation of NBSAPs. This includes making better informed decisions about key global policy priorities such as food security, water security and a just transition as the decarbonisation of economies and supply chains takes place.

> *A number of international organisations have been working on the challenge of improving nature-related data over many years... this is the moment for a step-change in multilateral efforts and investment in solutions to the shared global challenge of better quality nature-related data.*

For the private sector, frameworks, tools and standards for corporate reporting – such as the forthcoming TNFD framework and the SBTN methods for Montreal-aligned target setting – will be released this year. Accelerating the uptake of these and other assessment and reporting requirements requires high-quality, location-specific data, and data on the state of nature in particular.[3]

1 The equivalent of Nationally Determined Contributions (NDCs) in the Paris Agreement

2 2022 State of Finance for Nature report, UNEP, https://wedocs.unep.org/bitstream/handle/20.500.11822/41335/state_finance_nature_summary.pdf?sequence=3&isAllowed=y

3 State of nature: the condition and extent of ecosystem assets – TNFD, adapted from UN SEEA. 2021. System of Environmental-Economic Accounting – Ecosystem Accounting: Final Draft

Civil society actors, including Indigenous Peoples and Local Communities, who represent only 5% of the global population but steward 80% of the world's remaining biodiversity, also require access to better quality state of nature data to inform their conservation and advocacy efforts, and to better enable payments for ecosystem services resulting from their nature stewardship.

A number of international organisations have been working on the challenge of improving nature-related data over many years including supporting national institutional capacity.[4] However, across policymaking, business and financial institutions, there has been an overwhelming focus on climate change, with a consequent lack of investment in the other four drivers of nature change: land, freshwater and ocean-use change, pollution, resource exploitation and invasive alien species.

In light of the strong international commitments achieved in Montreal to halt and reverse nature loss, this is the moment for a step-change in multilateral efforts and investment in national and global solutions to the shared challenges of availability, quality, consistency and accessibility of nature-related data.

Unlike climate, where reducing greenhouse gas emissions is the main indicator, agreement on globally consistent methodologies or metrics for assessing the state of nature remains elusive, although progress has been made at national level through the UN System of Economic-Environmental Accounting Ecosystem Accounting (UN SEEA EA), agreed by the UN Statistical Commission as an international statistical standard in March 2021. Tracking nature-related impacts and dependencies requires collecting location-specific data across a large number of variables, such as soil health, water scarcity and biodiversity.

State of nature data provide a set of stock data for a baseline nature assessment and the foundation upon which other nature data sit. Without a robust baseline of the state of nature, we cannot fully or reliably assess change over time linked, for example, to government policies or business impacts. Nor can governments or investors assess the effectiveness of any efforts an organisation takes, or claims to take, to halt and reverse those negative impacts or invest in nature-based solutions that contribute to nature positive outcomes.

What nature-related data?

There is an identified priority gap on state of nature data (specifically on ecosystem condition) that needs to be addressed. Over time, other nature-related data needs could also be added to the scope of a possible nature data facility:

- Other state of nature metrics e.g. species extinction risk and other biodiversity metrics;
- Data on key variables for ecosystem service modelling and measurement;
- Data on impact drivers (akin to the Net Zero Data Public Utility (NZDPU) on green-house gas emissions); and
- Data on targets and transition for nature-related issues (akin to the NZDPU on emission reduction targets).

4 For example, the Global Biodiversity Information Facility, UNEP World Conservation Monitoring Centre and Global Earth Observations and the Group on Earth Observations Biodiversity Observation Network (GEOBON).

The challenge: credibility, collection, consistency and connection

The core challenge can be captured in four words – credibility, collection, consistency and connection:

- *The credibility* of high-quality, scientifically-robust state of nature data;
- *Collection* of additional high-quality state of nature data to fill critical data gaps;
- Enhancing the *consistency* of nature-related data to improve its decision usefulness to data users; and
- *Connecting* and maintaining data from different sources so that it is accessible and meets the information and analytic needs of data users.

A nature data landscape analysis undertaken by the TNFD in March 2022 concluded that there is a significant volume of nature-related metrics and datasets available and in use today. Many of these are used by corporates and financial institutions already, and pilot testing of the TNFD draft framework highlights that organisation can get started with the identification, assessment and disclosure of nature-related issues with many of the data sets and analytic products available today.

Nevertheless, in general terms, and given the expected exponential growth in demand for nature-related data, 'state of nature' data – for example, about ecosystem condition in specific locations – are currently inconsistent, irregularly updated, and hard to access. This is inhibiting practical action on nature-related issues by government, civil society, business and finance data users. While many G20 countries have long invested in national institutional capacity on state of nature data, often complemented by an active environmental research community, uneven data availability and access across multiple jurisdictions (within and among countries) present a major barrier to uptake.

> *Nature-related is still not current, consistent or comprehensive, nor accurate enough to provide the level of confidence and assurance required by data users*

Consequently, the transaction costs for finding, verifying and using nature-related data are high. UNEP-WCMC, IUCN and numerous conservation and scientific research organisations have consistently developed policy-relevant data products about nature and biodiversity, often supported by major advances in data mobilisation and accessed through infrastructure like the GBIF and the Group on Earth Observations Biodiversity Observation Network. However, nature data are still not current, consistent or comprehensive, nor at the required resolution to provide the level of confidence and assurance required by public sector, private sector and civil society stakeholders, stifling effective assessment, decision making and action. For example:

- Without a robust baseline of state of nature data, governments are inhibited from establishing comprehensive and up-to-date NBSAPs, as called for under the CBD;
- Corporates are incurring significant transaction costs to meet their existing regulatory requirements in some jurisdictions (e.g. Article 29 of the French Energy and Climate Law) and to prepare for further voluntary or regulatory commitments to report their dependencies, impacts and risks as called for in the GBF (e.g. by starting to use SBTN methods or make disclosures in line with the TNFD recommendations);

- Financial institutions lack sufficient and timely access to clear, consistent and comparable sets of metrics for assessing nature-related dependencies, impacts, risks and opportunities across their investment and credit portfolios in order to stop financing harmful activities and direct financing towards nature-positive outcomes.

Partly as a consequence of these quality, consistency and accessibility challenges, some large private sector corporates and financial institutions have invested considerably in proprietary nature-related data collection and analytic capabilities. Examples include beverage companies undertaking sophisticated water testing in watersheds and mining companies collecting soil and biodiversity data around mine sites. This high quality state of nature data would have significant value to a wider group of data users, including governments, other private sector actors and civil society organisations, but is generally considered confidential and proprietary. In general, corporates are not yet sharing state of nature data they collect for areas under their direct control. Funding constraints have also led some public institutions with considerable expertise in nature-related data to institute fee models and paywalls for their state of nature data sets, limiting access to those organisations with a capacity to pay.

To the greatest extent possible nature-related data should be accessible to a broad range of stakeholders and not kept behind paywalls or in proprietary systems

At the same time, the strong growth in demand for better quality nature data has helped to spur on a technological revolution in data generation and analytics. This presents a significant opportunity to accelerate improvements in the credibility, collection, consistency and connection of data sets, but this innovation would benefit from guidelines to drive consistency, comparability and connectivity.

- Next generation remote sensing data (e.g. from satellites and drones) is already widely collected and used, but this data can only meet part of the market's need for nature-related data.
- High-resolution satellite data, for example, can track land-use change (e.g. forest cover), but does not track biodiversity (particularly at species or genetic level) and critical ecosystem services.
- Innovations in in situ data collection technologies (i.e. data collected on-site) are enabling cheaper and more comprehensive measurements. For example, environmental DNA and AI-powered acoustic and imaging sensors can detect and monitor species occurrence.
- Advances in ecosystem service modelling are identifying what data and metrics are needed to understand ecosystem service provision, globally, nationally and locally.[5]

In short, higher quality, more comparable and easily accessible in situ state of nature data, baselining the state of nature and assessing changes over time will lower transaction costs for data users and enable better quality decision making about required actions to address nature and biodiversity loss and the risks to local communities, business, finance, economies and financial systems. Internationally agreed methodologies and data standards will significantly

5 Chaplin-Kramer et al. 2019. Science. Global modeling of nature's contributions to people. Available at: https://www.science.org/doi/10.1126/science.aaw3372

advance the accessibility and interoperability of nature-related data in support of a shared global agenda.

As much nature-related data is location-specific, it is commissioned and then maintained most likely by a government authority or a private sector data user. Public and private sector organisations, Indigenous Peoples and Local Communities all have a key role to play in accelerating the collection, connection and disclosure of credible in situ nature-related data but key issues of access and benefit sharing need to be addressed. More collaboration and greater transparency will, in turn, enable greater trust, leading to an exponential growth in the collection and connection of nature data. These efforts should be underpinned by internationally agreed methodologies and data standards, which will be critical to address the consistency challenge. Sustained levels of financing for the collection and maintenance of nature-related data is also a key challenge that needs to be addressed.

Addressing market failure: the case for globally coordinated action

High quality, nature-related data is clearly a global public good of value to a wide array of public, private and civil society stakeholders everywhere. Wherever possible, nature-related data should be accessible to a broad range of stakeholders and not kept behind paywalls or in proprietary systems.

As outlined above, existing levels of government funding to national statistics agencies, scientific research institutions and international organisations remain inadequate and have so far failed to incentivise the collection of credible and consistent data at the scale needed, nor facilitated the maintenance and connection of this data from both public and private data sources to deliver the core decision-useful information needed by this wide range of nature data users.

Based on current trends, the private sector is rapidly emerging as a producer of nature-related data, not just a consumer. State of nature data will increasingly be generated by private sector sources (everything from satellite to eDNA data). This will accentuate the challenge of harmonisation, connection and open access in the absence of standards, protocols and incentives for data quality and accessibility.

It is increasingly clear that government, scientific, private sector and civil society actors need to be brought together to contribute to a collective good solution at a global scale, aggregating their respective nature-related data expertise and capabilities into a common use platform. A targeted and coordinated intervention to address this market failure would:

- Develop clear frameworks on what data needs to be collected – and how this data should be collected, maintained, and made available in a way that provides a consistent, high-quality and accessible pool of decision-useful nature-related data;
- Provide the incentives to facilitate data collection maintenance and connection; and
- Develop a focal point for data access, given the global and diverse set of relevant stakeholders.

Based on these considerations, we believe there is a case for some form of global nature-related public data facility. This would be supplemented by country-led national and sub-national initiatives that can be aggregated and linked into the global facility. Several governments have, or are developing, nature-related data platforms. These capabilities could go some way to addressing user needs, but national level solutions alone would likely create data standardisation and comparability issues, resulting in both quality

assurance challenges and higher transaction costs, particularly for data users that need the same sort of data across many jurisdictions. It would also perpetuate data sovereignty concerns and risk data fragmentation, making the necessary data connections that are critical for key users like business, finance and civil society users more challenging.

We believe there is a case for some form of global nature-related public data facility.

A global nature-related public data facility – underpinned by the right scope, governance, financing and incentive structures, and enabled by globally consistent methods and standards for nature-related data that can be applied to national and sub-national contexts – could expand the availability and use of nature data and insights with significant benefits for public, private and civil society stakeholders globally.

- Governments would be better placed to set robust NBSAPs;
- International processes, such as the Conference of the Parties for the UNFCCC, CBD and UNCCD as well as intergovernmental organisations, would have access to better data to inform international policy coordination and collaborative action;
- Corporates will be incentivised to contribute and share their data and, in turn, be better placed to meet their regulatory reporting requirements at reasonable cost by accessing high-quality data from others and to make better informed voluntary commitments to net zero and nature positive outcomes; and
- Financial institutions will be better placed to shift financial flows to nature positive (and net zero) outcomes.

The urgency of the moment requires joint public and private sector action now if governments, business, finance and civil society are to meet the global policy objective of halting and reversing nature loss by 2030 and limiting global temperature rises to 2°C.

Key design considerations for a global nature-related public data facility

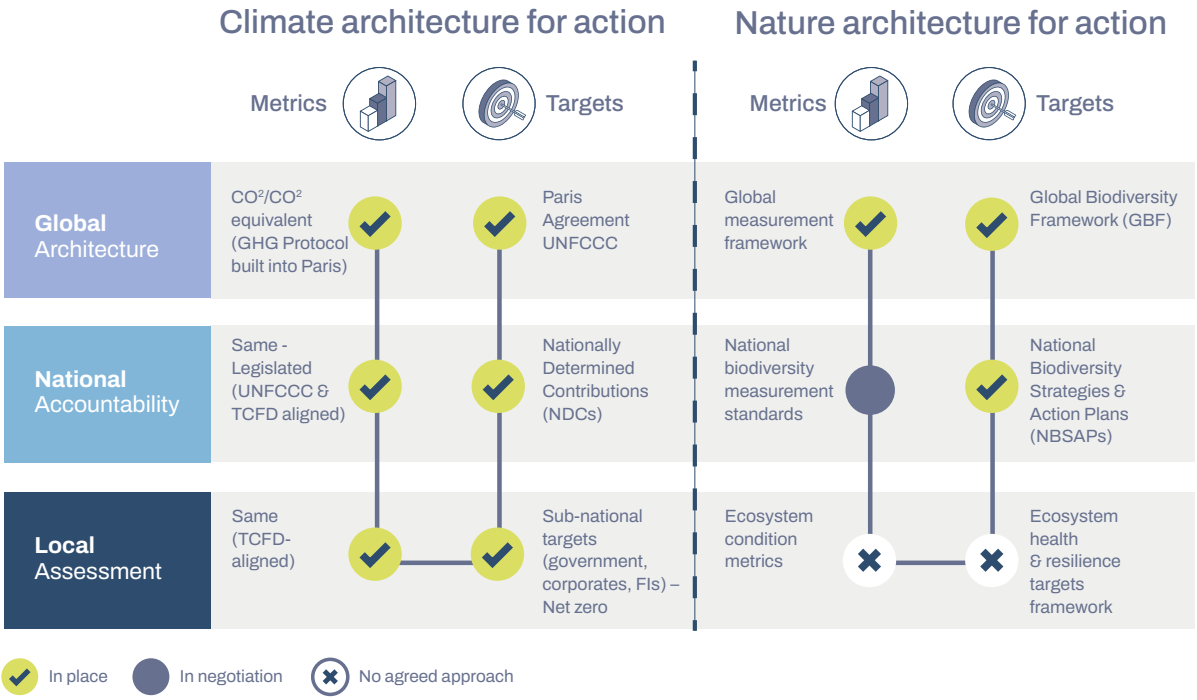
Given the central role that nature must play in achieving Paris-aligned net zero goals, a global nature-related data facility would complement the NZDPU announced in 2022 by President Macron and Michael Bloomberg as an "open data utility for climate transition-related data". In the climate space, the Greenhouse Gas Protocol (GHG Protocol) and significant international investment in climate data over the past 20 years have created a repository of relatively high quality, longitudinal data on climate-related impacts (input data). This helps to inform assessment, response and disclosure by government, business, finance and civil society users. Consequently, the NZDPU initiative is focused on the challenge of providing data users with better climate transition data (output data) to enable higher-quality transition planning and disclosure regarding the ambition and credibility of their net zero aligned transition plans.

We believe a global nature-related public data facility would be best served to focus on the shared global need for better state of nature data (i.e. input data) as a first priority

In contrast to the data landscape supporting climate change action, the architecture for action on nature-related issues is not supported by state of nature measurement methodologies akin to a GHG Protocol. Nor is there a comparable scale of investment in data credibility, collection, consistency and connection

across the land, sea and freshwater realms and biomes of nature.

Figure 1: Data is the key enabler for action across sectors



Consequently, we believe a global nature-related public data facility would be best served to focus on the shared global need for better state of nature data (input data) in the first instance. While there will inevitably be similar demand for nature-related transition data (output data), we believe better state of nature input data is the principal binding constraint at present and therefore the first priority that needs to be addressed by a nature-related public data facility as soon as possible.

This recommended approach for a global nature public data facility prioritises the establishment of a focal point for collating and connecting data that already exists.

Recognising that a lot of nature-related data already exists because of the efforts of a wide range of national and international institutions, conservation organisations and businesses in highly regulated sectors over many years, in our view, a global nature-related public data facility can deliver the most added value by:

- Connecting existing but disparate nature data sets to a shared point of access to enhance accessibility for all data users;
- Improving the consistency of that data by supporting the creation of, and promoting, a set of common global state of nature data methodologies and standards;
- Working with existing organisations and supporting national capabilities to address data gaps that

are aligned with those methodologies and standards; and

- Enhancing data access and encouraging the development of public and private sector analytics that would sit on top of the foundational data stack to enable more robust, repeatable and transparent assessment and decision-making by data users.

While there clearly remain a number of important data collection and maintenance challenges that need to be addressed, together with creating incentives to stimulate that data availability, this recommended approach for a global nature-related public data facility prioritises the collation and connection of data that already exists while providing a coordinated platform for subsequent efforts to encourage further collection of new data. By doing so, it will facilitate collaboration between public and private sectors and civil society organisations and support key stakeholders to deliver on their nature commitments as reflected in the GBF.

Archetypes considered for configuring a global nature-related public data facility

Addressing the four challenges of *credibility*, *collection*, *consistency* and *connection* has led to the consideration of a number of possible approaches or archetypes for configuring a global nature-related public data facility. These include:

1. **A nature data catalogue:** A catalogue or directory providing data users with signposts and links (much like Wikipedia) to recommended nature-related datasets and products that meet certain quality standards. These would be filterable based upon a set of relevant use case criteria to support discovery.
2. **A centralised database:** A centrally-managed data warehouse providing data users with direct access to data points, sourced from a multitude of different nature-related data sets, both public and private, that meet certain quality standards.
3. **A distributed access public data facility:** A global entry point to a decentralised data exchange that connects to nature related data products and services provided by contributing organisations, both public and private, whose data sets meet certain methodological and quality standards.

Annex 1 provides a summary of the comparative analysis of these three options against a range of design dimensions

Preliminary recommendation: the case for a distributed access data facility

As a result of this short, high-level scoping study, and based upon the experience, research and discussions among the organisations and individuals contributing to this study, we propose to advance further detailed consideration of a global distributed access public data facility (option 3).

This option is most likely to deliver the desired outcomes of enhancing the credibility, collection, consistency and connection of nature-related data for a wide range of data users, both public and private, at a global scale, within a reasonable time frame and at a reasonable cost.

We believe a distributed access data facility is most likely to deliver the desired outcomes at a global scale, within a reasonable time frame and at a reasonable cost.

A nature public data catalogue (option 1) would be the least complex and potentially most cost and time efficient to establish, but could leave significant unresolved consistency and data integrity issues and thereby fail to secure the confidence of data users.

Furthermore, we believe that the most appealing aspects of a data catalogue approach could be incorporated into the preferred option of a distributed access model.

While a number of governments have shown interest in data warehouse solutions (option 2), our collective experience in building and managing data systems and solutions (nature-related and in other domains) is that a unified global data warehouse would require a timeline beyond 2030 to develop and deploy, would be incredibly difficult to scale as a global solution, would be prohibitively expensive and, given the current lack of underlying methodologies and standards for state of nature data, still risk major user concerns with data integrity and consistency.

A distributed access public data facility could be designed to create a number of key desirable outcomes:

- Facilitate public and broad access to high-quality, robust nature-related data, with the participation of a wide range of public and private data providers as contributors;
- Be aligned with the methodologies and data needs of the latest guidance for nature-related assessments, including those now being developed and deployed in relation to government policy making and target setting embodied in NBSAPs, by the TNFD, by the SBTN and the Natural Capital Protocol; and
- Support the rapid acceleration of further data generation aligned with an agreed set of common global methodologies for state of nature data collection.

A distributed access data architecture is also recommended because it is best placed to:

- Maintain data sovereignty by leaving data ownership and responsibility in the hands of data and product owners, including national governments and other local stakeholders, which a centralised database would not;
- Be scalable over time as it does not rely on a central data model and can grow as data sets are enhanced and operational costs can be spread; and
- Most effectively provide the foundation for the development and delivery of more advanced data, insights and analytics capabilities that would enhance the foundational open access data stack provided by the facility. This would spur further innovation in data tools and analytics solutions to meet the diverse needs of a wide range of data users. These could be based on commercial models and behind paywalls for market participants, such as financial institutions, who need and have the capacity to pay for advanced analytic services.

Conclusion and proposed next steps

Given the interest of many governments, corporates, financial institutions and civil society organisations in addressing the collective challenge of access to higher-quality, more consistent nature-related data, we encourage the private and public sector to support the further detailed evaluation of the global nature-related public data facility outlined in this paper. Growing demand from government, business, finance and civil society actors to enhance nature-related data availability and access is also under active consideration by the UNFCCC and UN CBD processes (COP28 and COP16 respectively), given the growing acknowledgement of the inseparability of effective, well-informed action on climate change and nature loss simultaneously.

A wide range of additional stakeholders and experts, beyond those who contributed to this short and high-level scoping study, need to be consulted on the detailed design of such a facility.

We envisage a Stage 2 blueprinting phase of work to focus on:

A. Expanding consultations with a wider set of stakeholders, including end users of data to ensure a user-centred design;

B. Detailing the scope, governance, business model and implementation pathway of a global nature-related public data facility;

C. Developing scalable pilots to test its feasibility; and

D. Defining a long-term implementation plan and financing model.

It would cover key design questions such as:

- Whether or not a new institution needs to be created or whether an existing institution or initiative can be scaled-up to play the intended role of a global nature-related public data facility;
- The appropriate governance architecture for the facility as a global public interest institution;
- Feasible and sustainable funding models and funding sources;
- The relationship with,or possible integration with, climate data utilities (including the NZDPU);
- The design of data sharing and access agreements required to make a distributed access facility effective;
- The need to develop the underlying global core methodologies and standards for state of nature data that would be central to ensure the consistency of the data promoted by the facility; and
- The identification of any potential unintended consequences from having an open data facility of this kind and related mitigation plans.

Organisations interested in seeing this initiative for a global nature-related data facility advance are invited to provide their feedback to any of the organisations that co-led this scoping study or to contact **James d'Ath**, Lead of the Nature-related Data Catalyst convened by the TNFD at: james.dath@tnfd.global or datacatalyst@tnfd.global

Annex 1: Comparative analysis of archetypes for a global nature-related public data facility

The benefits, implementation challenges and user value of each option is described below:

	#1 A Nature data catalogue	#2 A centralised database	#3 A distributed access data facility
Description	A catalogue or directory providing data users with signposts and links to recommended nature-related datasets and products that meet certain quality standards, filterable based upon a set of relevant use case criteria to support discovery.	A centrally-managed data warehouse providing data users with direct access to data points, sourced from a multitude of different nature-related data sets that meet certain quality standards.	A global entry point to a decentralised data exchange that connects to nature-related data products and services provided by contributing organisations whose data sets meet certain methodological and quality standards.
Primary functionality	Support users to find relevant nature datasets, tools and products relevant for their use case.	Provide access to nature data via a centrally collated and managed data architecture, warehouse or similar solution for nature-related assessments.	Provide access to distributed nature data sets and products via a single entry portal.
Primary objective	Support data discovery: navigating and signposting users to relevant datasets and tools required to deliver on a use case. Guidance: Insights into what datasets and toots are required to measure nature and biodiversity at the global, national and business level.	Data access and sharing: Increase sharing and access to high quality, in situ state of nature data across all buckets of nature data. High quality: Process in place to enforce and maintain accurate data. Integration: Data are collected to be stored centrally and shared amongst relevant platforms with overlapping data.	Data exchange: Connects and provides access to data sets with common data models, standards and policies in place. Secure exchange: Connect systems into a secure exchange to access and integrate data. Provide the launch pad for analytics, providing the foundational structure for advance predictive and prescriptive analytics.

Benefits	Provide a central focal point for an ever-growing list of tools and products that is hard to navigate. Lowest development complexity: solution is focused on listing datasets and products only, with minimal complex development.	Builds up a central stock of state of nature data that can underpin use case delivery. Provides access to a holistic set of data across all aspects of nature and biodiversity data. Quality assurance and data quality is easier to govern (compared to a federated data facility) given central management structure and direct control over data.	Maintains data sovereignty by leaving data ownership and responsibility in the hands of data set and product owners. Scalable: More extensible over time (compared to a central database), as it does not rely on a central data model and can grow as data sets are enhanced. Provides comfort to integrate private data by allowing users to build data pipelines within their own systems and incorporate sensitive data without needing to move it outside of their architecture.
Challenges/ limitations	Does not directly increase data generation and sharing – provides guidance and signposting only.	Centralised data hosting may be a barrier to data sharing for key user groups (e.g. governments, corporates) who wish to maintain data sovereignty. Centralises data alignment requirements as all responsibilities stay in the realms of the central function. Centralises risk by having a central database that can be open to security vulnerabilities.	Relies on system wide adoption and all users and platforms to align and implement recommendations – a critical mass of data and users is needed for a federated facility to be useful. Relies on market to provide access to open data platforms, rather than developing its own warehouse solution.

Examples/ case studies	TNFD: The TNFD website provides a searchable Tools Catalogue that provides an overview of tools that can be used at each stage of the LEAP approach.	NZDPU: Open access to verified climate transition-related data (Scope 1-3) to increase transparency, enable action and encourage accountability. Designed to be a part of the UNFCCC's Global Climate Action Portal and currently in pilot stage.	GBIF: An international network and data infrastructure, funded by governments, implementing a distributed data architecture that enables regional facilities to be set up and feed data to a global platform. WABSI/SEAF (in development): A proposed regional hub and spoke model, underpinned by a tech platform, enabling key users to access shared environmental data and analytics in Western Australia. PACT: A platform hosted by WBCSD supporting standardised exchange of product-level emissions data, enabling companies to access primary data from their value chains to meet climate reporting requirements.

Taskforce on Nature-related
Financial Disclosures

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