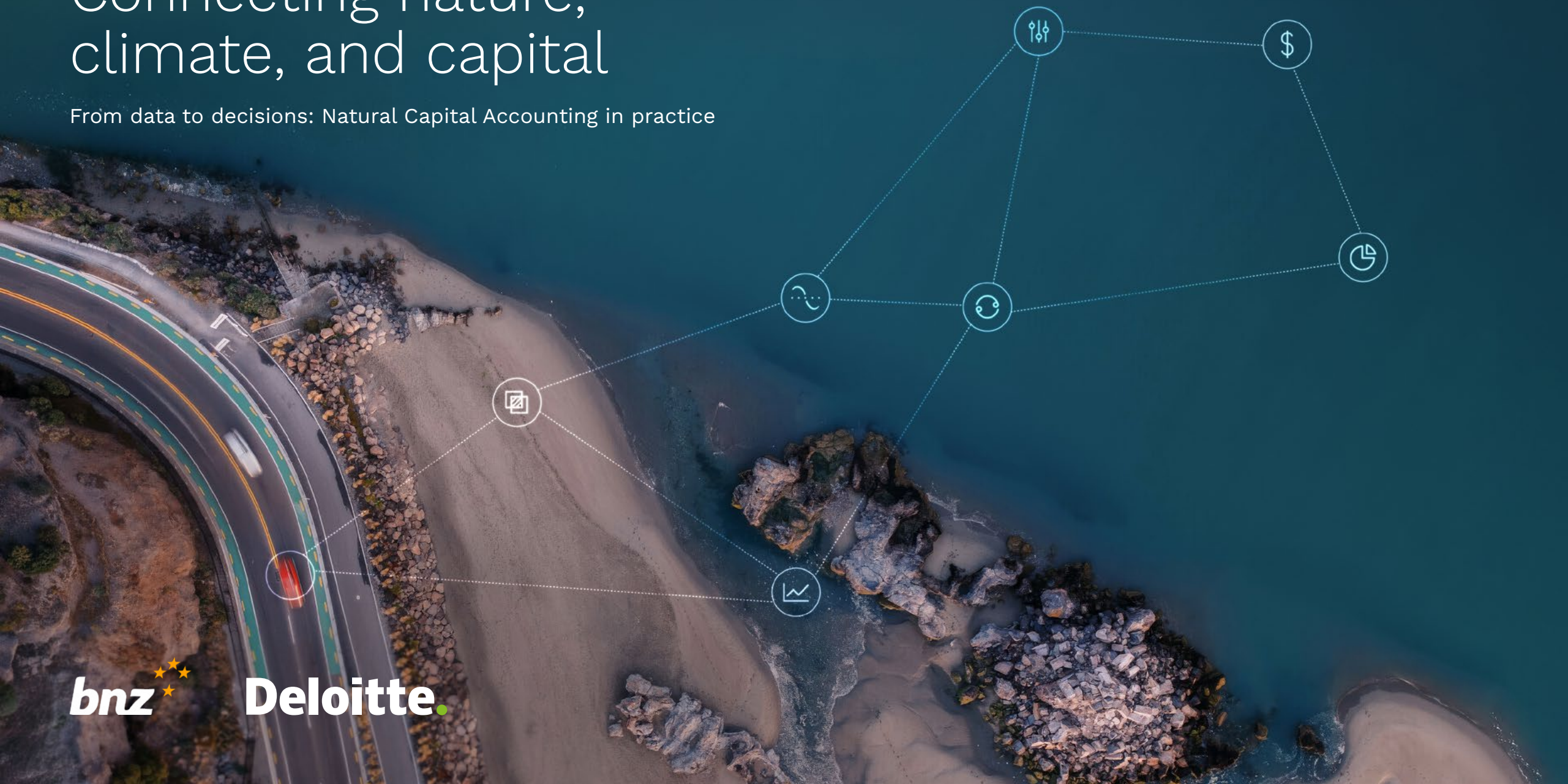
Connecting nature, climate, and capital

From data to decisions: Natural Capital Accounting in practice

September 2026



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This report is the second in the Connecting nature, climate and capital series. To access the first report, click on the 'Read here' button below.

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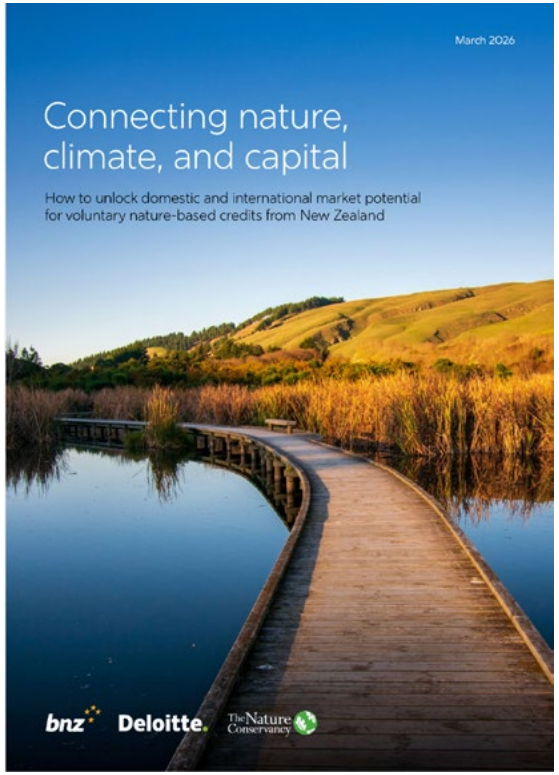
Disclaimer:
This report was compiled by Deloitte New Zealand as trustee for the Deloitte Trading Trust and the Bank of New Zealand to share insights from research, analysis and stakeholder engagement undertaken during the study. The findings and recommendations within this report are based on the evidence gathered and are intended to support informed decision-making. The findings presented here are based on the information and developments available during the preparation period, acknowledging that Government developments, market data, and use case maturity may have occurred subsequently. It should be noted that the content within this report does not necessarily represent the views or official positions of the organisations involved. The authors have aimed to present information objectively and accurately, without advocating for specific policy directions.



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Abbreviations

Abbreviation	Full description
A4N	Accounting for Nature
BIRS	Biodiversity Indicator and Reporting System
BNZ	Bank of New Zealand
CBAx	Cost-benefit analysis tool
CICES	Common International Classification of Ecosystem Services
CSIRO	Commonwealth Scientific and Industrial Research Organisation
EAA	Ecosystem Accounting Area
ENCORE	Exploring Natural Capital Opportunities, Risks and Exposure
GDP	Gross Domestic Product
GIS	Geographic Information System
IFRS	International Financial Reporting Standards
ISSB	International Sustainability Standards Board
IUCN	International Union for Conservation of Nature
LBI	Long-Term Biodiversity Index
LPC	Lyttelton Port Company
LSF	Living Standards Framework
NAB	National Australia Bank
NBIM	Norges Bank Investment Management
NCA	Natural Capital Accounting
NCAVES	Natural Capital Accounting and Valuation of Ecosystem Services

Abbreviation	Full description
NZ	New Zealand
QGIS	Quantum Geographic Information System
SBTN	Science Based Targets for Nature
SEEA	System of Environmental-Economic Accounting
SEEA CF	System of Environmental-Economic Accounting Central Framework
SEEA EA	System of Environmental-Economic Accounting Ecosystem Accounting
SNA	System of National Accounts
TNFD	Taskforce on Nature-related Financial Disclosures
UNSD	United Nations Statistics Division
TNFD-LEAP	Taskforce on Nature-related Financial Disclosures' Locate, Evaluate, Assess, Prepare approach

Contents

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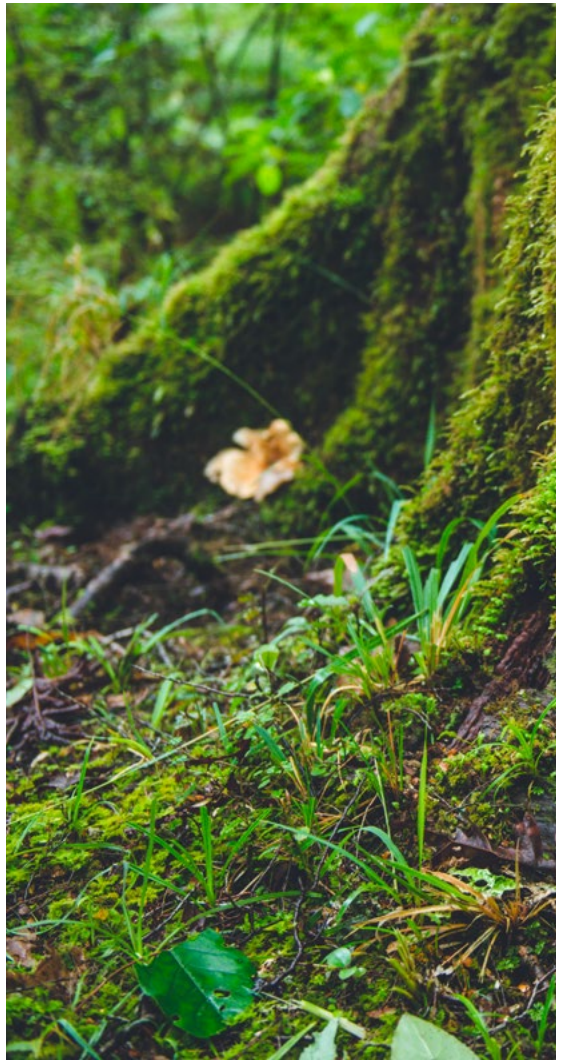


Objectives of the report

A. Purpose and Scope

The objectives of this report are to:

a. Provide practical steps to start accounting for nature in all sized businesses.

b. Provide a snapshot of Natural Capital Accounting approaches adopted in New Zealand and how they compare with the emerging dominant framework.

c. Present primary user use cases to articulate the importance and benefits of Natural Capital Accounting, including its potential to safeguard economic prosperity, strengthen organisational resilience and support the flow of financing for nature.

d. Provide an overview of the Natural Capital Accounting process using the System of Environmental Economic Accounting - Ecosystem Accounting (SEEA EA) framework.

This report is intended for business leaders, banks, investors, insurers, policymakers, finance officers and sustainability practitioners seeking to understand how nature-related information can be incorporated into decision-making.

It explains the rapidly evolving Natural Capital Accounting landscape, with a particular focus on the SEEA framework, the most widely used international framework for measuring natural capital, and its relationship to complementary frameworks such as the Taskforce for Nature-related Disclosures (TNFD) and emerging sustainability disclosure standards.

B. Methodology

The methodology behind this report included primary research in the form of interviews for the case studies and the use cases; secondary (desk-based) research; and a peer review by the Institute for the Development of Environmental-Economic Accounting (IDEEA Group) on how the SEEA EA framework and process was applied.

C. Approach to Case Studies and Use Cases

Drawing on case studies and use cases from New Zealand and overseas, this report considers what motivates organisations to establish natural capital balance sheets, and how they leverage natural capital information to inform decision-making.

Each case study presents the business drivers behind the assessment, the stakeholders involved, the methodologies, tools and data employed, and the decisions the information was intended to support.

The case studies also highlight common implementation challenges, including data availability, boundary setting, valuation approaches and governance considerations, providing practical insights for organisations considering their own natural capital accounting journey.

Interviews with banks, insurers and investors provide insights into how primary users may act on natural capital information, and how they perceive organisations that are undertaking this activity.

Executive summary

New Zealand's economic activity is deeply anchored in its natural capital base. Landscapes, soils, forests, and marine and freshwater ecosystems are the lifeblood of the sectors that power New Zealand's export earnings and prosperity. In view of the extent to which national export earnings are tied to natural assets, there is a clear incentive for New Zealand to actively pursue sustainable economic development through careful environmental management.

Despite the high degree of dependency on natural capital within sectors including the agriculture, energy and the built environment sectors, natural resources continue to remain only partially visible within investment valuations, lending decisions, underwriting, and prudential frameworks.

Natural Capital Accounting addresses this information gap by converting information on environmental assets and ecosystem services into a structured format that can inform investment and management decisions. This enables decision-makers to better understand how natural capital contributes to ongoing productivity; how it changes over time; and how those changes can materially impact productivity, revenue, and margin[1].

As climate stressors and growth pressures place increasing demands on our natural resources, understanding how nature supports sustained economic resilience and value creation becomes increasingly important.

However, questions persist on how we can best quantify, assess and signal the value of our natural capital base.

This report seeks to address this ambiguity by navigating the Natural Capital Accounting landscape to identify the most widely adopted methodologies, standards and tools for valuing nature. It also outlines the different ways in which some New Zealand organisations are starting to understand and manage their natural capital dependencies.

This report provides a perspective on the type of evidence and records needed to support information presented in natural capital accounts, by developing a more complete picture of the assets that underpin business performance and economic value creation.

Ultimately, Natural Capital Accounting is about making nature visible within economic and financial decision-making. As expectations around nature-related risk management and disclosure continue to evolve, organisations that understand, measure and manage their natural capital will signal to the market that they may be better positioned to strengthen resilience, manage risk and create long-term value.

Key findings

Defining the objective for a natural capital accounting assessment is the key first step
The organisations that contributed to the report all had a clearly defined use case, then selected the tools and frameworks best suited to addressing it.

Applying a materiality lens determines the business case for natural capital assessments
Most natural capital accounting assessments focused on the natural resources that are material to their unique organisation, determining the condition, the ecosystem services they provide and how changes could affect downstream value creation.

Data availability remains challenging but should not be a barrier to action
Organisations are demonstrating that they can still establish initial baselines, metrics and targets, despite early-stage challenges with data availability, monitoring quality, baseline setting and repeatability. By undertaking the process organisations can quickly identify which data gaps need to be addressed.

Spatial mapping is an indispensable input
Geographic Information System platforms, ecosystem mapping, ecological surveys, remote sensing and environmental datasets play a central role in identifying natural assets, defining assessment boundaries and understanding dependencies.

A multidisciplinary approach is vital
Natural Capital Accounting is not purely a financial accounting exercise. Effective assessments bring together ecological science, geospatial analysis, operational data, financial expertise, stakeholder engagement and management judgement.

Natural Capital Accounting is strongest when indigenous perspectives on ecological, social, cultural and economic outcomes are considered together
In Aotearoa New Zealand, concepts such as kaitiakitanga, mauri, whakapapa and intergenerational stewardship provide an important lens for understanding our relationship with nature and our responsibility to future generations.

Natural capital assessments indicate strong management capability
At the highest level, the case studies and use case interviews identified two main benefits of natural capital accounting:

- a signal to investors regarding management capability; and for users,
- more informed decision-making processes.

Banks, investors and insurers viewed organisations that had performed nature-related assessments as demonstrating stronger management capability, more mature governance, credible risk management and a long-term strategic outlook.

These organisations also had a deeper understanding of the dependencies on, and vulnerabilities within, the natural assets that underpin productivity and resilience.

There is broad alignment between local and international approaches
The report findings indicate that local practice in New Zealand is broadly aligned with international developments.

While organisations are not yet producing mature, audited natural capital accounts at scale, the underlying approaches are consistent with international practice. New Zealand organisations are already applying concepts relating to ecosystem extent, condition, ecosystem services, catchment-scale management and nature-related risk assessment. Refer to the case studies to see this in action.

01 Introduction

New Zealand's economic activity, social wellbeing, and long-term resilience are dependent on natural capital, including landscapes, soil, freshwater and marine ecosystems, and forests and the ecosystem services they provide. Resource-dependent sectors like agriculture, horticulture, fisheries, built environment, and the energy sectors depend not only on the availability of natural assets, but also on their condition – in other words, their capacity to continue providing healthy ecosystem services over time.

When natural resources are in decline, productivity becomes highly vulnerable to systemic risks like loss of pollinators, degradation of soil health, or over-enrichment of water bodies.[2] Consequently, these resources need to be managed carefully to sustain current and future demand.[3]

New Zealand is the world's largest single-country exporter of dairy products.[4] The food and fibre sector accounts for 82% of New Zealand's exports, with an export value of NZ$64 billion as at June 2026.[5]

New Zealand's built environment[6] is similarly expected to generate an annual value of NZ$65.4b by 2030.[7] However, it's resource dependency profile is comparable with the food and fibre sector, with one of the highest impacts in terms of natural resource loss and degradation.

The extent to which national export earnings are tied to natural assets provides a clear incentive for New Zealand to actively pursue sustainable economic development through careful environmental management.

Biodiversity loss and deforestation are increasingly recognised as systemic economic risk drivers. Yet their implications for financial markets remain poorly understood. The World Economic Forum's estimate that more than half of global GDP is moderately or highly dependent on nature and ecosystem services is, arguably, conservative.[8]

This estimate is conservative because the effects of nature loss have several implications for asset pricing. Risks stemming from nature loss can impact firms' profits in multiple ways, for instance, by disrupting supply chains (physical risk) or by prompting governments to strengthen environmental regulations (transition risk).[9]

If capital markets continue to underprice nature-related credit risk – in other words, if credit ratings and risk-weighted asset calculations fail to reflect natural capital exposure – there will very likely be longer-term implications for financial stability.[10]

A scenario modelled by the World Bank, where three ecosystem services collapse, resulted in annual losses to GDP of around US$2.7 trillion.[11] Yet a UNDP Sustainable Insurance Forum (SIF) survey of 27 insurance regulators and supervisors revealed that 59% have not yet undertaken an assessment of nature-related risks to determine whether such risks pose material financial impacts.[12]

Recent research by Agarwala et. al. highlighted that, sovereign credit ratings ignore these risks, meaning that markets may be mispricing, mismanaging and misallocating US$83 trillion of financial assets.[13] Sector-level data from the Reserve Bank of New Zealand shows that, as at May 2026, approximately 33% of total bank lending was directed to business and agricultural sectors that underpin the country's exports. Most of these sectors rely heavily on natural capital.[14]

Yet traditional financial accounting and disclosures in New Zealand make it difficult to ascertain whether the underlying natural asset fundamentals are well understood by the lender and the borrower. While financial accounting and sustainability reporting are both aspects of corporate reporting, in practice, they have remained largely distinct. As a result, environmental externalities are often excluded from the determination of profit, and from financial materiality assessments.[15]

With growing awareness relating to reinforcing feedback loops, where climate change accelerates nature degradation and weakens ecosystems' ability to regulate climate, the Network for Greening the Financial System (NGFS) is now calling on prudential supervisors to incorporate nature into climate risk scenarios for the purpose of stress testing.[16]

Similarly, the International Sustainability Standards Board (ISSB) is drawing attention to the nexus of climate and nature, and is stressing the need for these to be assessed together.[17]

To support this, a consistent approach to measuring, comparing, and reporting on the condition and value of natural capital is needed. The following pages set out the emerging leading practice and approaches to valuing natural capital.

1.1 What is natural capital?

Natural capital refers to all aspects of the natural environment including broader ecosystems and their services. In other words, the joint functioning of, or interactions among, different living and non-living environmental resources,[18] as seen in forests, soil, aquatic environments and the atmosphere.[19] It refers to the stocks and flows[20] of natural resources and environmental assets. Collectively, these resources provide the foundation for economic activity.[21]

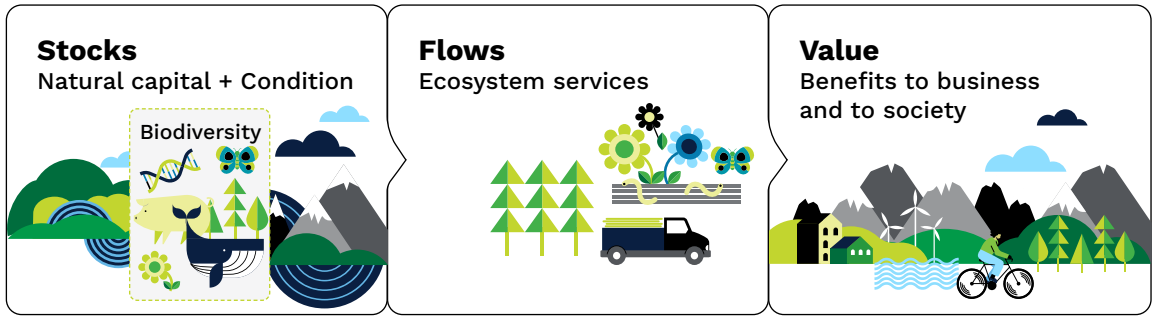
Natural capital ***stocks*** are the underlying inventory of natural resources. They can be renewable or non-renewable, and include both biotic and abiotic components:

- Abiotic stocks: Non-living assets such as minerals, fossil fuels, water bodies, and atmospheric gases.
- Biotic stocks: Living components including forests, wildlife, fish populations, and soil microorganisms.

These stocks are measured in terms of their *extent* (area, volume) and *condition* (health, diversity, or density). Maintaining these stocks is crucial because they form the foundational infrastructure of ecosystems.[22]

Natural capital ***flows*** are the ongoing, tangible and intangible benefits, collectively known as *ecosystem services*, that the stocks provide. These flows make human well-being and economic production possible.[23]

They are universally categorised into three types:[24]



Ecosystem services

1. Provisioning:
The tangible goods and resources provided by ecosystems, such as food, freshwater, timber, fibre, and raw materials.

2. Regulation and Maintenance:
The benefits ecosystems provide through regulating natural processes, including water purification, climate regulation, erosion control, pollination, and flood mitigation.

3. Cultural:
The non-material benefits people derive from ecosystems, including recreation, tourism, spiritual values, cultural identity, education, and aesthetic enjoyment.

Natural capital can inform national accounting processes, the development and progress of emerging markets,[25] and approaches to financial risk integration[26], and can be integrated within wellbeing assessment frameworks.[27]

Human activity both depends on and influences natural capital and when natural systems are degraded through overuse, pollution, land-use change, or by the impacts of climate change, the benefits they provide can become less reliable, more costly to replace, or in some cases impossible to restore.[28]

Natural capital accounts for aquaculture

The aquaculture industry depends on healthy marine ecosystems, with industry productivity influenced by the functioning of marine food webs, species diversity, habitat condition, and ecosystem resilience, rather than being determined solely by the status of individual fish stocks.[29]

Long-term fisheries data show declines in both catch size and the health of marine biodiversity since the late 1990s, with one report attributing these declines to changes in food web structures and trophic composition affecting overall productivity.[30]

A case study published by The Aotearoa Circle aimed to quantify the benefits of restoring the Kaipara Harbour and the terrestrial and marine ecosystems surrounding it.[31]

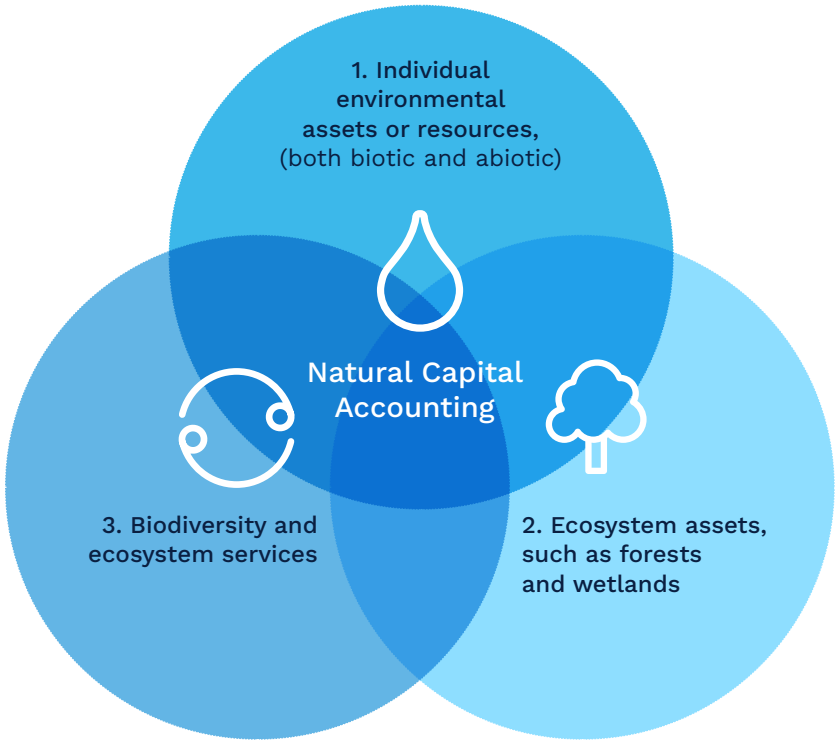
The study first quantified the natural capital in the Kaipara to determine a baseline. This area serves as a nursery for around 98% of the North Island's west coast snapper, creating export revenue of approximately NZ$35 million and contributing circa NZ$69 million annually to the economy.

The study noted that restoration activities could produce a return of NZ$3.94 for every NZ$1 invested, primarily returned to the local and national economies. It identified a further NZ$11 million in value gained due to the prevention of harm to people, property and infrastructure.

1.2 What is Natural Capital Accounting?

Natural Capital Accounting is a method for establishing a balance sheet that reflects changes in the stock and condition of natural assets, and integrates the value of ecosystem services into standard financial and economic reporting terms. It uses physical or monetary terms to track how nature supports the economy. It creates a consistent framework that provides a view of nature's economic and financial value, risk, and performance.

At its simplest, Natural Capital Accounting brings together three related areas:[32]



Natural Capital Accounting already informs how governments and organisations view and manage natural capital; 98 countries have incorporated Natural Capital Accounting into their system of national accounts. At its core, it enables decision-makers to assess the full economic value of their natural resources, such as forests, wetlands, and wildlife, and to understand their dependency on those resources, in order to maintain sustainable productivity.[33]

In the New Zealand context, The Treasury incorporates Natural Capital Accounting into its quadrennial Te Tai Waiora: Wellbeing in Aotearoa reporting,[34] and Stats NZ maintains annual environmental-economic accounts to track how the environment contributes to New Zealand's economy, the impacts of economic activity on the environment, and how New Zealand responds to environmental issues.[35]

The outputs of New Zealand's Natural Capital Accounting are operationalised through The Treasury's Cost-benefit analysis tool (CBAx)[36] to support impact assessments in the context of Treasury's Living Standards Framework.[37] These CBAx metrics are updated regularly by The Treasury to enable policymakers and organisations to monetise non-financial impacts in order to perform financial cost-benefit analysis.

Natural capital accounts for the built environment

The built environment system is responsible for 40% of global resource consumption and, along with energy systems, is responsible for approximately 12% of nature and biodiversity loss worldwide.[38]

The introduction of nature-positive infrastructure and assets has the potential to mitigate a significant portion of this impact, while securing societal and economic resilience.

A case study included in The Aotearoa Circle's Natural Infrastructure Plan noted how Christchurch City Council[39] has avoided an estimated NZ$14 million in capital costs to date by replacing traditional piped stormwater infrastructure with a naturalised network of wetlands, swales, floodplains and ecological corridors.

It notes how this has reduced long-term operating and maintenance costs and enabled urban development while maintaining flood risk at pre-1991 levels.

The nature-positive approach has also restored and expanded Natural Capital through the protection and restoration of hundreds of hectares of wetlands and greenspace.

It has resulted in extensive stream restoration, planting of more than 600,000 native plants, and improvements to water quality. It has also enabled the protection of downstream properties through reduced exposure to flood risk.

1.3 The evolution of Natural Capital Accounting

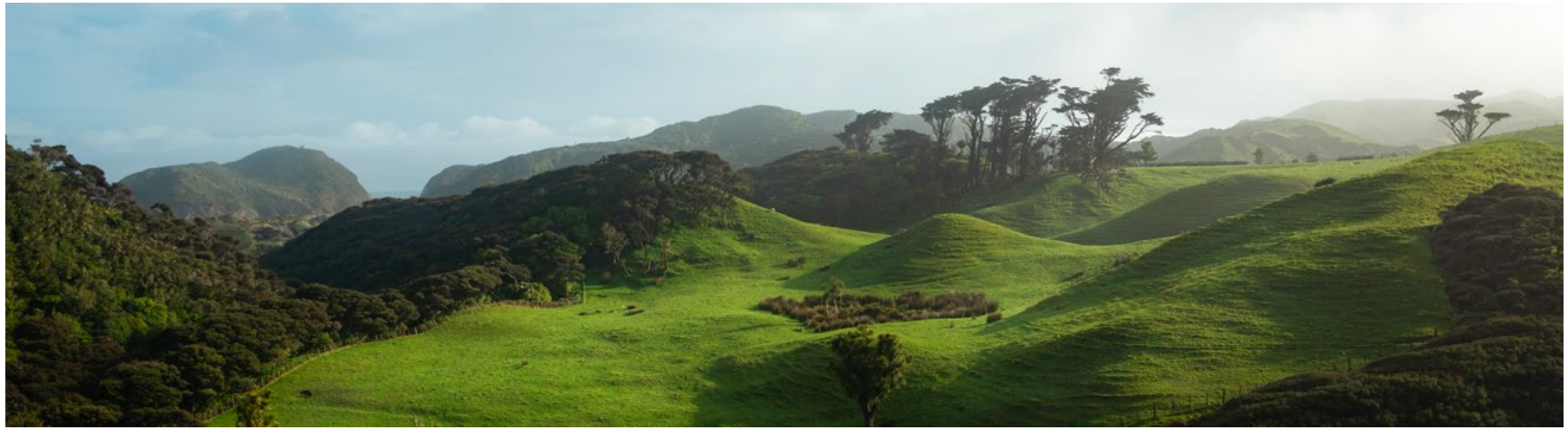
Natural Capital Accounting has evolved significantly over the past two decades, giving rise to standards, frameworks, methodologies and tools that support the measurement, assessment, management, and reporting of nature-related information.

While these approaches are often discussed collectively under the umbrella of natural capital accounting, they have been developed for different purposes and are applied at different stages and scales, ranging from national statistical systems through to entity-level corporate disclosure.

For organisations and stakeholders that are new to Natural Capital Accounting, the diversity of frameworks, guidance and methodologies, can be difficult to navigate.

Some frameworks are designed to establish consistent methods for measuring environmental assets and ecosystem services. Others focus on translating environmental information into business risks and opportunities, supporting strategic decision-making.

The international standard setter is signalling the need for businesses to address their natural capital dependencies. ISSB's IFRS S1 and its forthcoming Nature-related Practice Statement (due out October 2026), are designed to enable organisations to communicate nature-related performance and exposures to investors, regulators, and broader stakeholders in a consistent and comparable format.



Natural capital accounts for agriculture

The agriculture and dairy industries are heavily dependent on reliable rainfall, healthy catchments, and the availability of clean water to support pasture growth and the production of high-quality milk.[40]

In New Zealand, approximately 99% of the water footprint[41] associated with pastoral dairy milk production is attributed to water used for pasture and feed growth. Water scarcity footprints varied significantly, ranging from 14.16m^3 to 208.39m^3 world equivalent per kilogram of milk produced.[42]

These findings from Massey University underscore the critical importance of maintaining healthy catchments and ensuring reliable water availability.

The table below maps the Natural Capital Accounting landscape. It presents the dominant methodologies, frameworks, and standards for measuring, valuing, and disclosing natural capital.

Table 1: Methodologies, frameworks and standards for measuring, valuing and reporting on natural capital

The architecture (how the pieces fit together)

Layer	Framework / Standard	Purpose	Uptake	Scale of application	Relationship to Natural Capital Accounting
Quantification/ Accounting methodology	System of Environmental-Economic Accounting (SEEA) Central Framework.	Standardised measurement of natural capital stocks, ecosystem extent, condition and service flows.	Adopted by 98 countries as a basis for developing national natural capital accounts.[43]	National level	Primary global accounting standard.
	SEEA - Ecosystem Accounting.	Extends SEEA to ecosystem-level accounting.	As of March 2026, 58 countries[44] are compiling SEEA EA and/or thematic accounts.	National and entity level	SEEA extension to capture biodiversity and ecosystems.
	Natural Capital Protocol[45] **Superseded by the Capitals Protocol*	Framework for corporate nature valuation and impact quantification.	Over 450 organisations provided input into the development of the protocol.[46] There are no public uptake figures disclosed.	Entity level	Corporate application of Natural Capital Accounting.
	Commonwealth Scientific and Industrial Research Organisation's (CSIRO), The Nature Capital Handbook.[47]	Guidance on corporate Natural Capital Accounting, impact, dependency and risk/opportunity assessment, and reporting.	No public uptake figure is available as the handbook is an open-access user guide.	National level	Extends accounting concepts.
	ISO14054 -2025: Natural Capital Accounting for organisations - principles, requirements and guidance.	An emerging standard which provides terminology, principles, requirements and guidance for the preparation of natural capital accounts for organisations.	Adoption figures not disclosed.	Entity level	Accounting standard that defines reporting principles and requirements for developing entity-level natural capital accounts.
	Treasury NZ's Living Standards Framework.[48]	A framework developed to understand the drivers of wellbeing (at a national level) and to consider the broader impacts of policy advice in a systematic and evidenced way. Includes suggested parameters for quantifying ecosystem services that directly impact on social wellbeing. Relies on the Treasury's NZ's CBAx[49] cost benefit analysis tool inputs for quantifying the impact of environmental criteria on national wellbeing.	-	National level	Identifies ecosystem services that impact human wellbeing, for which SEEA can be applied to enable quantification of impacts.
	Accounting for Nature (A4N) Standard.	Emerging valuation standard supported by a suite of measurement methods.	Global uptake figures not published.	National and entity level	Measuring environmental condition.

Layer	Framework / Standard	Purpose	Uptake	Scale of application	Relationship to Natural Capital Accounting
Assessment Methods *(the 'so what?' for business)*	Taskforce on Nature-related Financial Disclosures (TNFD) - (LEAP) Locate, Evaluate, Assess, Prepare.[50]	TNFD-complementing approach on the assessment of nature-related risks and opportunities.	Adopted by 56 countries and jurisdictions, and 733 business and financial institutions.[51]	Entity level	Enables identification and management of nature risks and opportunities (that the SEEA Framework helps quantify).
Target setting guidance	Science Based Targets for Nature.[52]	Provides technical guidance for corporates on setting Science-Based Targets for Nature.	Currently, 150 companies are preparing to set Science-Based Targets for Nature (SBTN), collectively representing NZ$5.5 trillion in market capitalisation.[53]	Entity level	Guidance on target setting.
Disclosure Standards and Frameworks	International Sustainability Standards Board (ISSB) International Financial Reporting Standards (IFRS) S1 - General Requirements for Disclosure of Sustainability-related Financial Information.	IFRS S1 and S2 are international reporting standards that support consistent and comparable disclosure of climate and nature-related risks, opportunities and strategies. IFRS S1 is currently being updated to include a practice statement on nature-related disclosures.	More than 45 countries are on the journey to the adoption of IFRS S1 and S2.[54]	Entity level	Used to disclose the outputs of Natural Capital Accounting and nature risk and opportunity assessments.
	TNFD – Taskforce on Nature-related Financial Disclosures.[55]	The TNFD is a global, market-led initiative providing organisations with a risk management and disclosure framework. The ISSB recently announced that TNFD will be fully incorporated into IFRS S1, and consequently, will soon be retired.	Adopted by 56 countries and jurisdictions, and 733 business and financial institutions.[56]	Entity level	Uses outputs of Natural Capital Accounting.

02
Case studies

In the context of resource use, a successful business must generally satisfy three conditions.

It must have access to resources, be able to process them and have sufficient demand for its products. Natural Capital Accounting adds a fourth condition: Can the ecosystems that support the business continue producing the necessary resources, indefinitely?

Natural Capital Accounting helps organisations understand whether the environmental assets underpinning their business model are being maintained, enhanced, or depleted, and what that means for future procurement costs, supply chain resilience, operating expenditure, asset values, and long-term commercial viability.

The three case studies presented on the following pages illustrate how natural capital accounting has been applied in practice at organisations in the infrastructure, agriculture and built environment sectors.

They are intended to provide practical examples of how organisations have approached nature valuation and Natural Capital Accounting.

Each case study highlights the drivers behind performing the assessment, the stakeholders engaged and involved, the boundaries and materiality thresholds applied, and the standards or frameworks used to guide the process.

The case studies also examine the specific tools and datasets used, the extent to which social and cultural considerations were incorporated into valuation approaches, and provides some of the key takeaways and lessons learned throughout their experience in nature valuations.

2.1 Infrastructure

Lyttelton Port Company: Natural Capital Accounting as a practical management and decision-support tool.

Why Lyttelton Port Company undertook natural capital accounting

"Our business and local communities rely on natural capital, which includes assets, resources and other benefits provided by nature. LPC's dependency on natural capital is evident through revenue from imports and exports, infrastructure longevity, raw material provisioning, freshwater supply, operational conditions and maintaining cultural, recreational and aesthetic values in Whakaraupō/Lyttelton Harbour."
LPC Nature-related Disclosures 2024 Report

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Key objectives

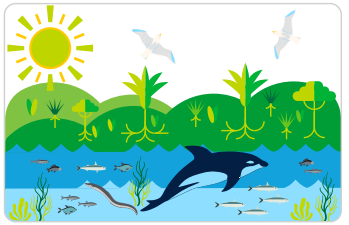
The key objectives included:

- Integrate nature-related considerations into business planning, asset management and capital investment decisions.
- Strengthen the evidence base for restoration and environmental management.
- Inform LPC's biodiversity-positive strategy and response to emerging nature-related disclosure expectations.
- Improve understanding and disclosure of the positive and negative environmental impacts of port operations and future development.

Natural capital in infrastructure

Natural capital underpins our economy, but is largely invisible in our accounting systems.

Infrastructure assets
Ports are crucial for global trade, handling over 11 billion tonnes of goods annually and supporting millions of jobs globally. However, if the combined challenges of efficiency, climate resilience, and sustainability are not well managed, ports can incur severe property damage, major supply chain delays, and steep financial losses.



Ecological assets
Ports rely heavily on healthy marine and coastal ecosystems that provide erosion and flood control, sedimentation regulations, helping to shield them from climate impacts andmaintain uninterrupted daily logistics.

Recognising financial and non-financial costs
By designing infrastructure that supports habitat restoration such as mangrove restoration, and incorporates natural habitats features, such as using living breakwaters, ports can benefit from hazard mitigation, increased biodiversity, improved water quality, carbon sequestration, and additional recreational spaces.
These benefits can reduce capital investments, lower maintenance costs, and yield multifaceted positive outcomes.

Case study overview

Approach:
LPC sought to improve visibility of the ecosystem assets, services, dependencies and impacts associated with LPC's operations across Whakaraupō/Lyttelton Harbour and its wider operating context. The information provided a basis for Board and management engagement on biodiversity planning, nature-related disclosure and future integration of nature considerations into business decision-making.

As a first step, LPC focused on understanding ecosystem extent and condition, dependencies, impacts, ecosystem services, and nature-related risks and opportunities. The key was to scale approaches across global, national and local standards and metrics. LPC's impact assessment follows global guidance for assessing impacts on key drivers of nature change, while using a locally relevant ecological assessment framework to produce robust, comparable and repeatable outputs. The Environment Institute Of Australia And New Zealand (EIANZ) based assessment for level of effect of an activity on nature considers the magnitude of effect, the recovery of species over time and the ecological value of the habitat.

Primary users of the information
The outputs were presented through a combination of reports and spatial mapping products. The primary users of the information include LPC's Board of Directors, Executive Leadership Team, Environment and Sustainability Team, and selected operational teams. The outputs supported Board and management understanding of nature-related dependencies, impacts, risks and opportunities, and helped provide an evidence base for LPC's Board-approved Biodiversity Roadmap 2025–2030. The outputs also support stakeholder engagement, community communication and external reporting.

To what extent did tangata whenua and social considerations inform the approach?
LPC operates within Whakaraupō/Lyttelton Harbour, where Te Hapū o Ngāti Wheke are mana whenua and mana moana. LPC is also a partner in the Whaka-Ora catchment initiative, an iwi-led programme focused on restoring the ecological and cultural health of the harbour from mountains to sea. LPC has referenced ecological and cultural indicators contained within the Whaka-Ora plan and intends to strengthen the incorporation of cultural values and Māori perspectives in future disclosures and assessments through ongoing partnership with mana whenua.

Key learnings and insights

Challenges faced
Lack of New Zealand-specific Natural Capital Accounting standards, methodologies and disclosure guidance created challenges in adapting global frameworks to local ecological conditions.

Regional datasets and ecological benchmarks suitable for site-level decision-making were limited.

Defining appropriate ecological reference conditions, thresholds and indicators for measuring ecosystem health and change over time was technically challenging.

Attributing ecosystem service benefits and impacts to a single organisation was difficult because ecosystem services are generated through complex, catchment-scale ecological processes involving multiple actors.

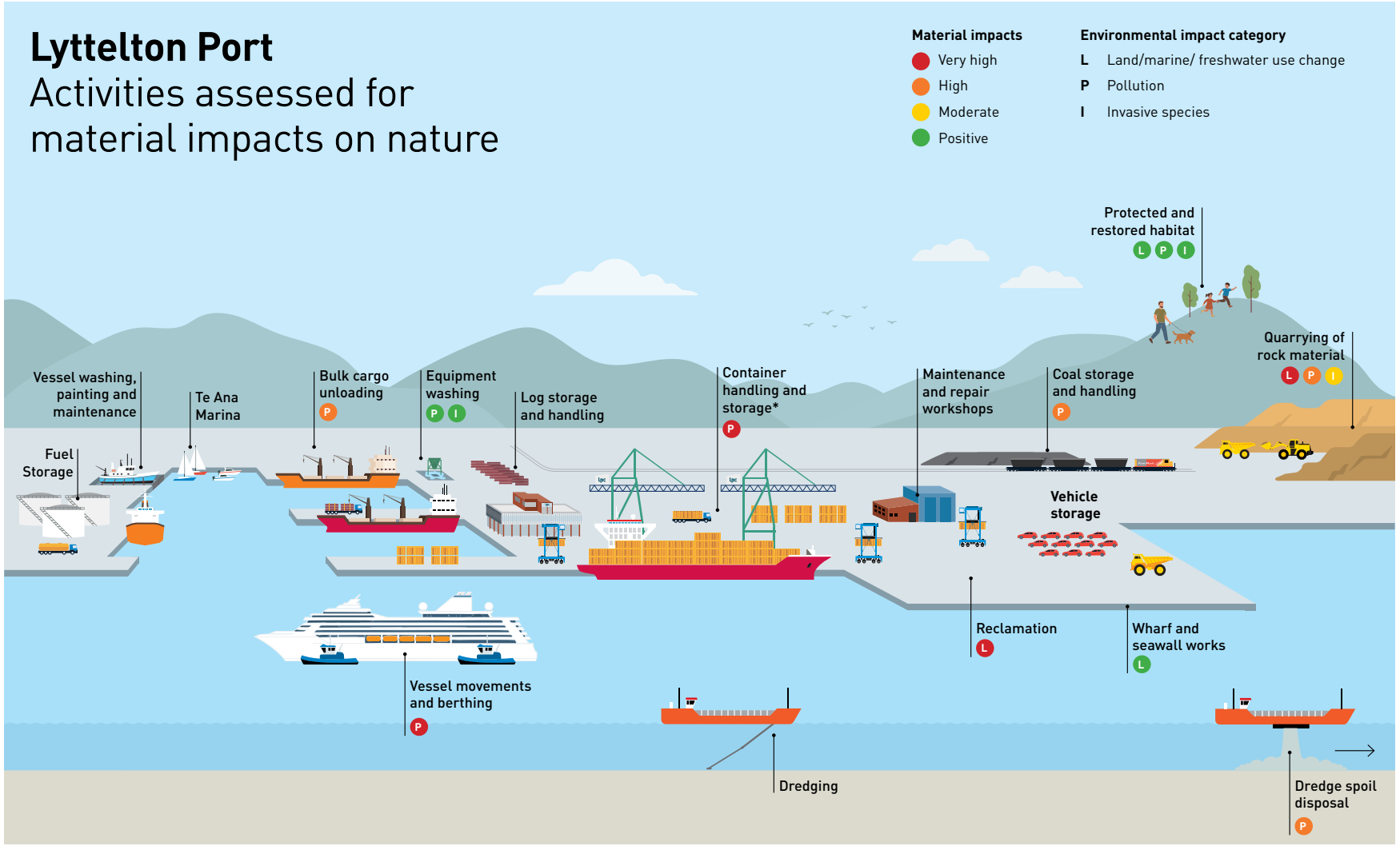
How LPC will use the information
Prioritise and track action to avoid and reduce environmental impacts, restore and regenerate habitats, and progress towards biodiversity-positive outcomes.

Integrate nature-related considerations into Board and management decision-making, business planning, asset management and capital investment.

Improve future nature-related disclosures and assessments as data, methodologies and reporting expectations mature.

Key outputs

A key output was the assessment of material impacts from Port activities on nature.



2.2 Agriculture

Pāmu: Natural Capital Accounting to support resilience, productivity and stewardship

Pāmu, on why they undertook nature valuation.

There are several fundamental reasons for accounting for nature:

1. It informs management decisions, such as how water is managed, or farm environment plans, or catchment decisions.
2. It informs resilience strategy: farms with stronger biodiversity tend to recover faster from extreme weather, manage water more effectively, and maintain productive capacity over time.
3. It enables defensible product claims, and in doing so, meet growing local and international demand for products that create good biodiversity outcomes.

Key objectives

Pāmu's key objectives included attracting and converting premiums for Pāmu's products through:

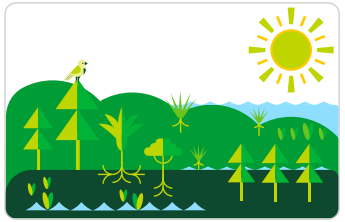
- transparent operational and nature-based activities and improvements;
- creating more value per hectare;
- enabling nature restoration work to become self-funding; and
- making nature-based markets accessible to a range of New Zealand farmers and landholders.

The information supports decisions that improve the long-term resilience, productivity and stewardship of Crown-owned land. It improves Pāmu's visibility of the natural assets and ecosystem services supporting farming and forestry operations. It also strengthens strategic discussions, investment framing, risk management and long-term value creation.

Natural capital in agriculture

Natural capital underpins our economy, but is largely invisible in our accounting systems.

Agriculture assets
Traditionally, accounting focuses on a limited set of assets, such as farm equipment, livestock, inputs and land.



Ecological assets
Are invisible in the traditional view, but a farm's natural capital can materially affect its productivity, profitability and resilience.

Recognising financial and non-financial costs
The full picture of a farm's assets enables decision-making on investment in andmanagement of natural capital. This provides evidence of nature-positive farm operations and elevates natural capital as an essential part of the economy.

Case study overview

Approach:
At Pāmu, valuing natural assets recognises the essential role nature plays in its core business - farming and forestry - and embeds that value into strategic decision-making. To do this, Pāmu developed portfolio-scale natural capital accounts that measure both natural capital stocks and ecosystem service flows. The process has improved Pāmu's visibility of the natural assets and ecosystem services that support its farming and forestry operations. In practice, the natural capital accounts have provided a basis for strategic discussions and investment framing, while reinforcing the importance of maintaining natural asset condition and resilience to support future productivity, long-term value creation and risk management.

The initial valuation focused on five material services: grazed biomass, timber production, water supply, climate regulation through carbon storage, and habitat maintenance and biodiversity. These were selected through a structured materiality assessment because they were relevant to farming and forestry operations and supported by credible data and valuation methods.

Primary users of the information
The intended primary users include senior leadership, finance and decision-support teams, sustainability teams, governance bodies and investment decision-makers. Secondary audiences include shareholders, regulators, funders, industry stakeholders and the wider public.

The outputs are presented through a Natural Capital Report supported by natural capital accounts, leadership and Board papers, presentations, workshops, and supporting dashboards or analysis where appropriate.

To what extent did tangata whenua and social considerations inform the approach?
Pāmu's initial priority was to improve understanding of the natural assets supporting its operations and long-term performance. The current framework does not explicitly adopt or align with Te Ao Māori indicators. However, Pāmu noted that future development may consider additional cultural, social and intergenerational perspectives as methodologies mature, where these perspectives support stewardship and decision-making objectives.

Key learnings and insights

Challenges faced
Data availability and quality were significant constraints. Information on biodiversity, soils, water quality and ecosystem functions was often patchy, coarse-scale, inferred or outdated.

Some ecosystem services could not be robustly valued and therefore required exclusion or qualitative treatment.

Methodological challenges included measuring ecosystem condition, establishing credible causal pathways between nature and business outcomes, and valuing biodiversity, water quality and other complex services.

Avoiding false precision while balancing technical robustness with practical usability.

How Pāmu will use the information
Use the outputs as an internal asset management and decision-support tool, rather than placing nature on the financial balance sheet, to:

Support capital allocation, land-use optimisation, risk management and long-term planning.

Improve visibility of the factors influencing future productivity, resilience and value creation, and strengthen strategic discussions and investment framing.

Progressively embed the information in operational decisions as condition monitoring and ecosystem service measurement improve.

2.3 Built Environment

Fletcher Living LowCO Pilot: A low-carbon housing pilot that expanded into a broader test of environmental performance.

Why Fletcher Living explored natural capital through LowCO

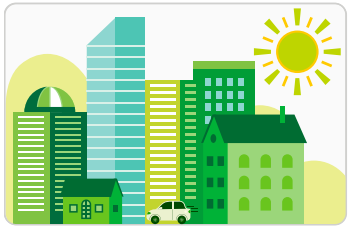
LowCO began as a challenge to radically reduce the carbon footprint of typical New Zealand homes. It has become a living case study in how carbon, energy, water, landscape and biodiversity outcomes can be improved together, measured in use, and evaluated for scale.

Key objectives

- To re-imagine how homes could be built more sustainably, showcasing a pathway to a low-emission, climate-resilient future in a mainstream housing context.
- To identify practical interventions that could improve the environmental performance of future homes at scale.
- To test the feasibility and performance of lower-carbon, energy-efficient and water-efficient design solutions.

Natural capital in the built environment

Natural capital underpins our economy, but is largely invisible in our accounting systems.



Built environment assets

Most building material prices only cover direct business expenses; they do not always take into account the full costs associated with resource depletion, environmental damage and CO^2 emissions.

Ecological assets

The increasing pressures on natural resources, and their role in complex ecosystems, are often overlooked and underpriced.

Recognising financial and non-financial costs

By incorporating environmental costs into project design, increasingly scarce resources can be sustainably managed, reducing longer-term cost exposure and avoiding dangerous tipping points.

Case study overview

Approach:

Fletcher Living developed the LowCO pilot at Waiata Shores in Auckland to understand the carbon impact of its residential design approach, test how far those impacts could be reduced in a mainstream housing context and support industry-wide change. The pilot assessed lower-carbon materials, operational energy reduction, improved thermal comfort, water-efficient systems, biodiversity-supporting landscapes, food-growing features and waste reduction measures. Although it did not prepare a formal natural capital account, it created a measurement-rich evidence base for assessing environmental performance.

The pilot showed that making embodied carbon and operational performance visible through home and on-lot design, modelling and monitoring could identify practical interventions for future homes. What began as a carbon-focused initiative expanded into a broader test of biodiversity-supporting landscape design, food production, stormwater management, circularity and community connection. The result was a practical demonstration of what low-carbon housing could achieve and a blueprint for replication.

Primary users of the information
The outputs were presented through carbon and energy assessments, water performance metrics, biodiversity-supporting landscape assessments and ongoing post-occupancy monitoring data. The information is primarily used by Fletcher Living's sustainability, development, design, procurement, construction, sales and leadership teams to understand occupant experience, maintenance requirements, seasonal performance and system reliability, and to determine which interventions are practical, affordable and scalable.

The outputs also support wider industry learning and customer proposition development, including local government. For example, a low-carbon vehicle crossing developed through the pilot contributed to Auckland Transport's subsequent Practice Note 05 for low-carbon concrete. The outputs have established a broad evidence base for understanding environmental performance in a residential development context.

Modelling, monitoring and performance assessments undertaken through the pilot indicate that LowCO could significantly reduce energy consumption and related carbon emissions, reduce water consumption through greywater recycling and treated rainwater, minimise landscape run-off and enable other water- and energy-related efficiencies, as shown in the following table[64]

Impact area	Results
HomeStar™ building rating	Achieved a rating of 10 stars on the HomeStar™ V5 certification scheme, the highest built rating available from the New Zealand Green Building Council.
Thermal efficiency	Designed to support indoor temperatures of approximately 20 to 21°C year-round.
Building emissions	Homes were modelled to emit seven times less carbon over their lifetime than a typical new-build standalone home in New Zealand.
Water savings	Capacity to save approximately 80% of potable water, with early monitoring indicating reductions of approximately 90%.
Avoided waste	Approximately 90% of construction waste was diverted from landfill.

To what extent did tangata whenua and social considerations inform the approach?
The pilot reflected Te Ao Māori principles through its design approach, including manaaki whenua, manaaki tangata and recognition of water as a taonga. After completion, the learnings were shared with local iwi Te Ākitai Waiohua, and a wider group of iwi.

The design also addressed social considerations by seeking to improve resident comfort, reduce resource consumption, support food growing and create neighbourhood spaces that foster interaction and connection.

Key learnings and insights

Challenges faced
There was no established Natural Capital accounting approach or widely adopted toolset tailored to residential housing developments.

Delivery required coordination across multiple disciplines, including design, construction, supply chains, utilities and consenting processes.

Some planning and regulatory settings constrained alternative design solutions that may have delivered improved environmental outcomes.

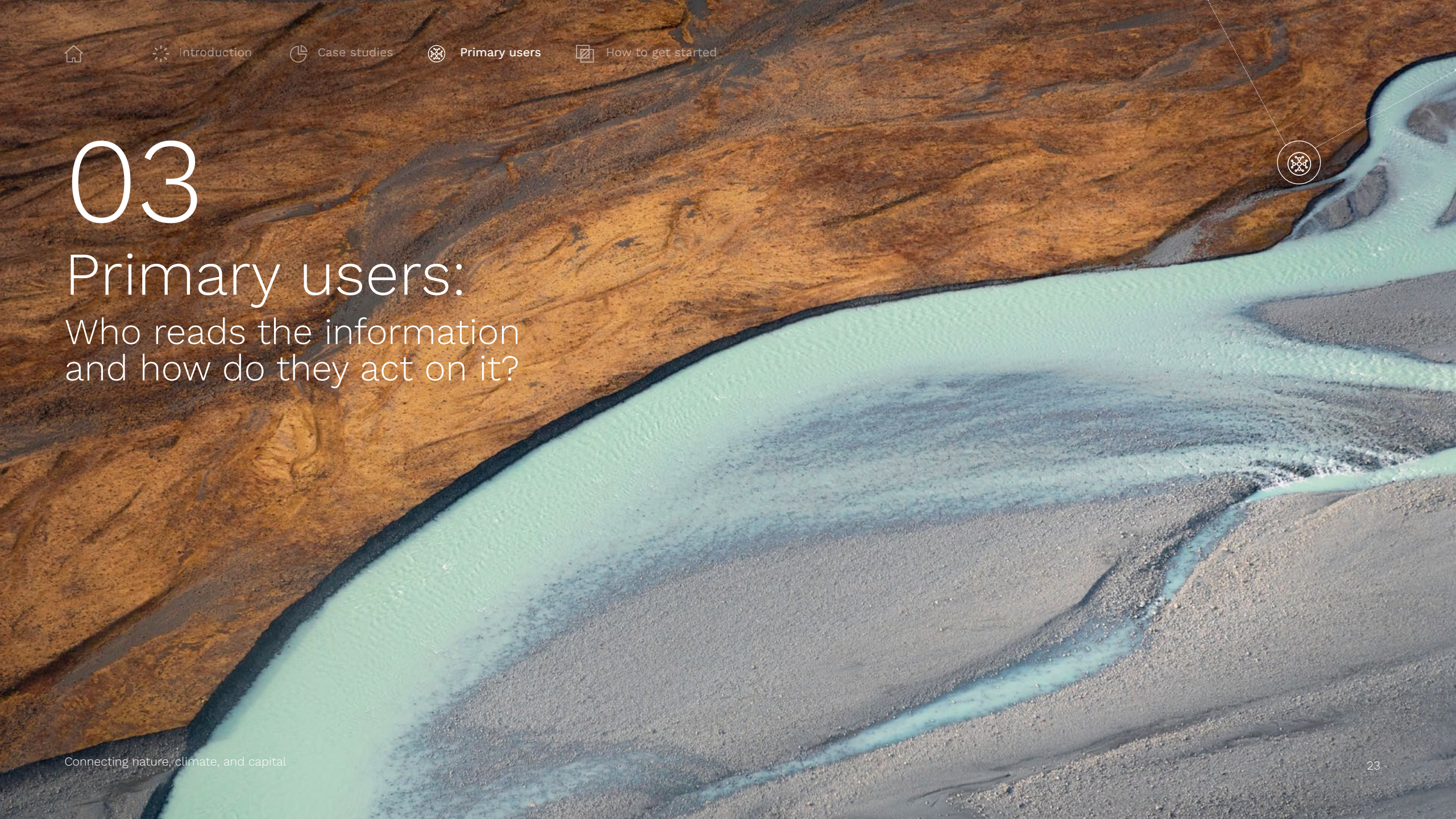
Biodiversity outcomes were difficult to verify because ecological monitoring was insufficient to measure changes in species abundance, soil health or habitat condition.

How Fletcher Living will use the information
Refine housing specifications, design decisions and customer propositions using evidence from sustainability, development, design, procurement, construction, sales and leadership teams.

Apply practical insights on operational energy reduction, thermal comfort, water efficiency, and biodiversity-supporting landscapes such as a meadow and waste reduction to future projects.

Support future development planning, environmental performance assessment and customer engagement.

Build the evidence needed to demonstrate wider environmental uplift, strengthen Fletcher Living's brand and support its social licence to operate.



03

Primary users:

Who reads the information and how do they act on it?

3.1 Who is reading natural capital information and how are they acting on it?

Having understood the business drivers for why entities undertake Natural Capital Accounting, it is useful to also understand how primary users act on this information. Banks, investors, and insurers can influence nature outcomes through their underwriting, credit risk modelling, and screening practices. For example, they can exclude activities that cause significant harm to ecosystems, apply conditional coverage linked to resource management measures, differentiate premiums to reward nature-positive behaviour and use standards-based due diligence to assess the quality of nature-related assessments.[57]

However, Natural Capital Accounting has yet to become a mainstream practice. Across the three use cases included in this report, a common finding was that the current lack of large, consistent and reliable datasets limits Natural Capital Accounting's use as a standalone financial metric. At present, the primary value of Natural Capital Accounting lies in demonstrating that an organisation understands, measures and actively manages its nature-related dependencies, impacts and risks. Nevertheless, all three stakeholder groups interviewed indicated that natural capital information can inform decision-making where it is linked to financial outcomes, risk exposure, or opportunities to strengthen resilience.

The findings outlined in the table on the following page derived from stakeholder interviews with Bank of New Zealand, National Australia Bank, Norges Bank Investment Management (manager of the Norwegian Sovereign Wealth Fund) and Howden Global Insurance Group.

The Bank

The banks interviewed view Natural Capital Accounting as an indicator of management experience and capability to respond to environmental change, but acknowledged that this is a nascent activity in New Zealand.

In future, when Natural Capital Accounting data is readily available in a consistent format, it has the potential to inform the bank's lending appetite and credit risk assessments.

It would also provide visibility at a portfolio level to help shape the banks' strategy, in terms of setting targets to manage the net impact of financed nature-related risk or expected credit loss relating to nature risk.

Perceived benefits of NCA

- Provides insight into management capability.
- Enables more informed engagement with large customers operating in nature-dependent sectors.
- Helps identify customers with stronger resilience and better preparedness.
- Supports portfolio-level analysis of nature-related exposure and can inform future lending strategy and sector positioning.

Perceived challenges of NCA

- Natural capital information is unlikely to be available at the standard and consistency required to incorporate into traditional credit assessment metrics in the near term.
- Current use is primarily qualitative rather than directly embedded in lending decisions.
- Greater confidence in the data would require independent verification, consistent methodologies and robust data, over longer time horizons.
- Demonstrating measurable outcomes from management interventions remains critical. Cost and complexity mean adoption may be concentrated among larger corporates initially.

The Investor

Environmental metrics and quantified nature disclosures help investors determine whether nature-related issues could become financially material and whether the company is managing them effectively.

Resource dependency indicators can inform assessments about whether environmental issues are financially material to a business.

Items on a natural capital account are themselves often not financially material; they become financially material when they create legal, regulatory, community relations or licence-to-operate risks.

Perceived benefits of NCA

- Provides material information that can help investors assess management quality, environmental governance and strategic awareness.
- Supports the investment assessment by indicating whether environmental issues are being managed before they affect financial performance or enterprise value.
- Strengthens the investment case where the account is supported by specific performance metrics and a clear connection between natural-resource dependency and financial materiality.

Perceived challenges of NCA

- Investors need underlying environmental performance metrics to assess whether nature-related issues could become financially material.
- The link between nature dependencies and financial materiality must be readily identifiable.
- Valuations that are inflated, poorly substantiated or disconnected from observable market mechanisms can undermine investor confidence.

The Insurer

Natural capital information is relevant to insurance in three distinct ways:

1. Nature as a modifier of conventional risk: insuring an operating business, where the condition of natural assets affects hazard and loss severity.
2. Nature as the insured asset: carbon projects, forestry and blue carbon are insured today, with the account acting as a precondition to cover rather than a pricing input.
3. Nature on the balance sheet: insurers as institutional investors with exposure to nature-dependent credit.

The insurance market is beginning to focus on how nature-risk management impacts cash flow, and how this informs product types and pricing.

Perceived benefits of NCA

- Supports better discussions with underwriters about how a company differs from peers through risk mitigation actions.
- Can inform future insurance pricing, product design, risk selection and alternative structures such as parametric insurance.
- Improves insurance purchasing decisions by matching cover more closely to actual exposures.
- Encourages a forward-looking assessment of risk rather than reliance on historical loss experience.
- Enables insurance of nature-based assets that would otherwise be uninsurable, by providing the valuation basis required to set sums insured and limits. In this context, NCA are the carbon/biodiversity credits, which we can value and insure.

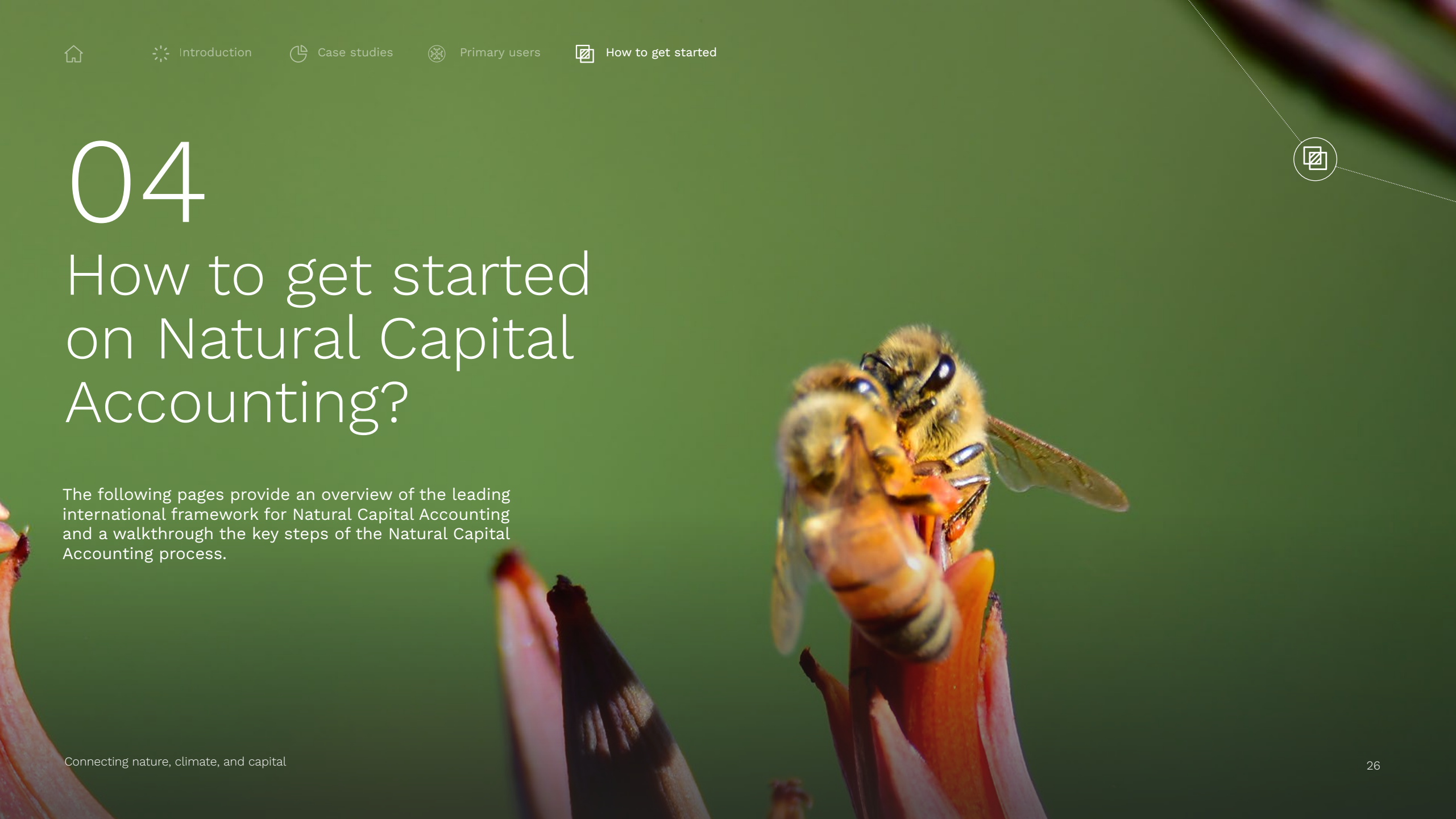
Perceived challenges of NCA

- Limited historical datasets make it difficult to establish robust relationships between Natural capital indicators and claims outcomes.
- Insurance pricing is not currently providing strong incentives for investment in nature-based resilience.
- Nature-based interventions are often harder to evaluate than engineered resilience measures.
- Limited capacity, low nature literacy and the perception that nature is primarily a disclosure issue, continue to slow adoption and understanding across the market.

04

How to get started on Natural Capital Accounting?

The following pages provide an overview of the leading international framework for Natural Capital Accounting and a walkthrough the key steps of the Natural Capital Accounting process.



4.1 Introducing the System of Environmental-Economic Accounting - Ecosystem Accounting (SEEA EA)

Formally adopted by the United Nations in 2012[58], SEEA offers a standardised and internationally comparable methodology for Natural Capital Accounting. SEEA consists of two primary components:

- The SEEA Central Framework focuses on accounting for individual environmental assets[59], including water, minerals and energy, capturing both their physical flows and monetary values.
- SEEA Ecosystem Accounting extends this by measuring ecosystem extent, ecosystem condition and the services ecosystems provide.[60]

Together, these components aim to enable a comprehensive understanding of how environmental assets contribute to economic activity and how they change over time.

SEEA is intended to support a wide range of applications, including policy design, land-use planning, resource management and sustainability analysis. Its status as an international statistical standard ensures consistency, comparability and credibility across jurisdictions, making it the central pillar of the global Natural Capital Accounting landscape.

According to an annual survey used to monitor the progress of SEEA implementation, as of 2025, 98 countries had implemented SEEA at the national level, with 71 (72%) regularly publishing at least one account.[61] This figure establishes SEEA as the primary global framework for Natural Capital Accounting at the national level.[62]

The framework was designed to align with the System of National Accounts (SNA), an accounting system for measuring economic activity, dating back to the 1950s.[63] This alignment enables environmental information to be integrated into the accounting structures used to measure economic activity, using the concepts, structures, rules and principles of the framework.[64]

At the organisational level, corporate adoption is slowly increasing. Case studies explored in Section 2.0 demonstrate how the SEEA Ecosystem Accounting methodology can be applied at the entity level to calculate and measure biodiversity and ecosystem extent and condition, and note the challenges and limitations faced in doing so.

Based on these case studies, and in the wider context of international standards and frameworks, as detailed previously in Table 1, there is a converging system where:

- SEEA provides the environmental-economic accounting foundation.
- Valuation frameworks support interpretation and decision-making.
- Tools such as ENCORE operationalise natural capital at the entity level.
- Disclosure frameworks communicate nature-related information.

Stats NZ has incorporated SEEA into New Zealand's System of National Accounts and publishes the natural capital balance annually.[65]

Stats NZ's Environmental-Economic Accounts show how the environment contributes to New Zealand's economy, the impacts of economic activity on the environment, and how New Zealand responds to environmental issues.[66]

This economic contribution was highlighted in the most recent set of accounts with the finding that activity in the marine economy leads to further economic activity in non-marine industries. In 2023, the marine economy contributed NZ$5.2 billion to New Zealand's GDP. Other industries, both marine and non-marine, supply intermediate inputs used in the production of goods and services in the marine economy. Measuring these indirect effects, therefore, gives an indication of the broader economic significance of the marine economy. This broader measure was estimated at NZ$8.6 billion in the year ended March 2024, with the indirect component accounting for NZ$3.5 billion (40.2%).

4.2 How SEEA links to TNFD, ISSB, and corporate Natural Capital Accounting

As noted earlier, the defining characteristic that sets SEEA apart from other frameworks is the alignment of the accounting method to GDP valuation under the System of National Accounts. By contrast, other frameworks primarily serve as environmental risk assessment and disclosure guidance, or as environmental valuation models.

SEEA offers a measurement and accounting foundation that policymakers and organisations already rely on as a key evidence base. Where SEEA provides the underlying natural capital accounts, TNFD and IFRS S1 translate the natural capital accounts into financially relevant risk insights that can be disclosed in a consistent format. SEEA, TNFD, IFRS S1, and entity-level natural capital methodologies should therefore be viewed as complementary to Natural Capital Accounting, rather than as competing approaches.

Organisations establish a natural capital balance sheet by identifying ecosystem assets, quantifying their physical condition, and assigning monetary or non-monetary values to them. Tools to support spatial analysis, such as GIS analysis platforms and remote sensing tools, play a vital role in determining the natural capital balance sheet, bridging the SEEA accounting methodology with quantitative risk assessments using the LEAP method (see opposite), and disclosure requirements, set by the TNFD and IFRS S1.

To date, the TNFD framework is recognised by investors, banks, insurance companies, corporates, and regulators as the most widely used framework for assessing and disclosing nature-related business risks.[67]

TNFD's LEAP[68] guidance for assessing nature-related risk has been developed to assist organisations in carrying out the due diligence required to meet international disclosure standards:

Nature-related disclosure standards such as TNFD and IFRS S1 provide a risk management and disclosure framework that organisations can voluntarily adopt to report and address nature-related risks.

Regulatory direction is converging, with TNFD and ISSB's IFRS S1 amalgamation becoming the defacto global nature disclosure standard.[69]

SEEA measures, accounts and calculates

TNFD's LEAP approach enables consistent assessment and provides consistent metrics

Output: Natural Capital accounts in financially relevant risk insights disclosed in a consistent format. IFRS S1 and S2 enable consistent disclosures.

4.3 Applying SEEA at the entity-level

The SEEA Ecosystem Accounting principles were initially designed to be consistent with national accounts. Translating SEEA from a national to an organisational context requires judgement about scale, boundaries, materiality, and the specific use case.

When applying these principles at the entity level, it is important for organisations to clearly define attribution boundaries, given their influence, dependencies and impacts on ecosystems beyond their direct sphere of control, both up- and downstream through their value chain.

The primary and secondary research performed indicates that expectations of audit-ready information are likely to increase over time. SEEA-aligned metrics can therefore offer robust and defensible measurements, particularly for New Zealand businesses exposed and vulnerable to risks related to land, water, biodiversity, and climate.

4.4 The process for applying SEEA

As for all accounting, SEEA applies a structured process that is clear, evidence-based, and repeatable. Its practical application depends on a series of decisions about purpose, scope, boundaries, data sources, indicators, valuation methods, governance, and reporting. These decisions are particularly important, as the credibility of the resulting information depends on the quality of the underlying process and evidence base.

To aid understanding, the process is outlined on the following page.

How to apply SEEA

The process map on this page steps through the approach to applying the SEEA EA methodology for valuing nature, adapted by Deloitte based on the orginal framework. Click each step to read a more detailed process outlined in Appendix A.

16 steps across 8 connected phases to implement SEEA

01 Mobilise and scope

1.1 Define decision-use case and target users

1.2 Select account modules and maturity pathway

02 Boundary and units

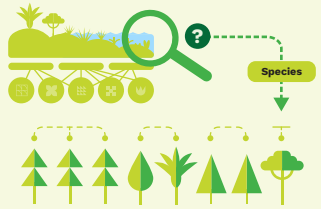
2.1 Define ecosystem accounting area (EAA) and reporting boundary

2.2 Delineate ecosystem assets and basic spatial units

2.3 Classify ecosystem assets by ecosystem type

03 Extent account

3.1 Compile ecosystem extent account



04 Condition account

4.1 Select ecosystem condition characteristics and variables

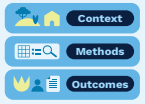
4.2 Define reference levels and calculate condition indicators/indices

5.1 Identify material ecosystem services and beneficiaries /users

5.2 Measure physical ecosystem service flows

05 Ecosystem services physical flows

6.1 Select valuation basis and methods for service flows



6.2 Value ecosystem assets using NPV where appropriate

06 Monetary valuation

7.1 Integrate physical and monetary accounts into combined presentations

7.2 Link to management, policy, strategy or disclosure processes

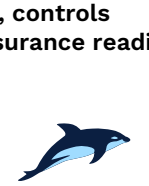
07 Integration and reporting

8.1 Establish data quality, uncertainty and limitations framework

8.2 Create assurance-ready evidence pack and control framework

08 Quality, controls and assurance readiness

Managing the natural capital stock of renewable and non-renewable natural resources
e.g. Plants, animals, air, water, soils, minerals that combine to yield a flow of benefits to people.



4.5 Assessment against SEEA EA methodology steps

We have assessed the approaches taken by each of the case studies in Section 2.0 to analyse their degree of alignment with the approach prescribed by the SEEA EA methodology. This provides a sense check as to how well the SEEA EA methodology aligns with the requirements and characteristics of New Zealand entities in the context of Aotearoa's unique environment.

This assessment should not be interpreted as an evaluation of entities' performance against the SEEA EA framework. Rather, it provides an indication of how New Zealand entities are approaching Natural Capital Accounting, using SEEA EA as a reference point.

4.5.1 Lyttleton Port Company

Degree of alignment with SEEA EA methodology ☐ Yes ☐ No ☐ Partial

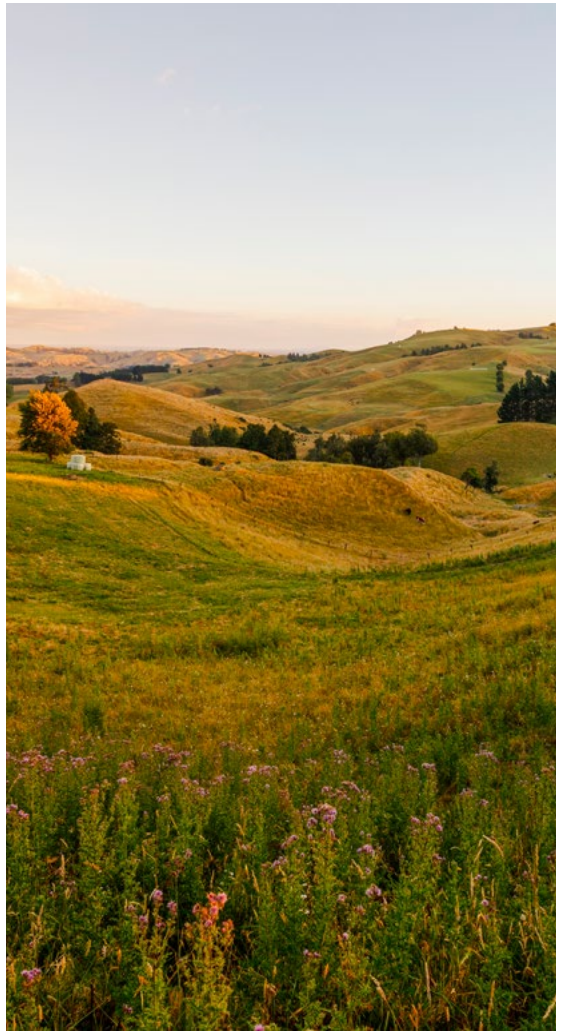
Relevant SEEA EA Phase	Relevant Methodology Steps	Tools utilised (if any)	Application within this case study	Degree of alignment
Boundary and units	1.1 Define Ecosystem Accounting Area (EAA) and reporting boundary	ArcGIS	LPC adopted a catchment-based approach that considered both its direct operational footprint and the wider ecosystems that support its activities. The initial assessment focused on Lyttelton Port and its direct area of influence within Whakaraupō/Lyttelton Harbour. Over the past two years, the scope was expanded to include LPC's three operational locations: Lyttelton Port, CityDepot and Midland Port.	☐
	1.2, 1.3 Delineate ecosystem assets and basic spatial units; Classify ecosystem assets by ecosystem type	ArcGIS, spatial datasets, ecological surveys	LPC identified and assessed ecosystem stocks relevant to its operations and wider harbour context, including coastal and marine habitats, freshwater resources and indigenous biodiversity.	☐
Extent account	2.1 Compile Ecosystem Extent account	ArcGIS, spatial datasets, ecological surveys	The assessment incorporated two spatial scales: • LPC's direct operational footprint, where actions can be directly managed. • The wider harbour and catchment ecosystem, where outcomes depend on collaboration with landowners, community groups, mana whenua and other stakeholders.	☐
Condition account	3.1 Select Ecosystem Condition characteristics and variables 3.2 Define reference levels and calculate condition indicators/indices	Resource consent monitoring data, marine and terrestrial ecological surveys, technical expert inputs	LPC assessed ecosystem condition using ecological indicators, habitat assessments and monitoring data. LPC adopted a 2020 baseline year, in alignment with TNFD guidance, and used 1875 as a historical reference point to support a qualitative understanding of long-term environmental change. However, the assessment did not fully quantify baseline condition or net change across all ecosystem services and ecological indicators.	☐
Ecosystem services and physical flows	4.1, 4.2: Identify material ecosystem services and beneficiaries/ users; Measure physical ecosystem service flows	ENCORE, ArcGIS, ecological and operational datasets	The assessment focused on ecosystem services, dependencies, impacts and nature-related risks that were material to LPC's operations and its broader environmental and stakeholder context. This was informed TNFD guidance and the Exploring Natural Capital Opportunities, Risks and Exposure (ENCORE)[70] framework. To identify material dependencies and nature-related risks, and understand where monitoring, mitigation, restoration and regeneration efforts should be prioritised, ecosystem services were evaluated on their financial, operational, social and reputational importance to the business. While LPC did not explicitly quantify ecological deficits or surpluses, the process identified areas where ecosystem condition had been altered historically and where restoration and regeneration actions could improve outcomes over time.	☐

4.5.2 Pāmu

Degree of alignment with SEEA EA methodology Yes No Partial

Relevant SEEA EA Phase	Relevant Methodology Steps	Tools utilised (if any)	Application within this case study	Degree of alignment
Boundary and units	1.1 Define Ecosystem Accounting Area and reporting boundary	GIS systems, FarmIQ*, internal datasets	Pāmu defined the project boundary around direct operations within farm boundaries and developed the initial accounts across its corporate portfolio, covering Natural Capital assets controlled by Pāmu. The approach identified Natural Capital assets and ecosystem services relevant to Pāmu's farming and forestry operations, including assets associated with soils, water, ecosystems, climate regulation and forestry.	
	1.2, 1.3 Delineate ecosystem assets and basic spatial units; Classify ecosystem assets by ecosystem type	GIS systems, FarmIQ, Geomaster	The approach identified Natural Capital assets and ecosystem services relevant to Pāmu's farming and forestry operations, including assets associated with soils, water, ecosystems, climate regulation and forestry.	
Extent account	2.1 Compile Ecosystem Extent account	GIS systems, Geomaster, FarmIQ	Pāmu's approach used spatial and operational datasets to support portfolio-level Natural Capital accounting, including forestry, farm and GIS information.	
Condition account	3.1 Select Ecosystem Condition characteristics and variables	GIS systems, monitoring reports, QEII covenant records, internal accounting and valuation models	Pāmu considered the condition and resilience of natural assets such as soils, water, biodiversity and ecosystem functions. However, condition data were identified as a significant limitation, with biodiversity, soils, water quality and ecosystem functions data described as patchy, coarse scale, inferred or outdated.	
	3.2 Define reference levels and calculate condition indicators/ indices	Internal models, monitoring data, valuation studies	The assessment incorporated condition-related information where available, but the response indicates that some ecosystem services could not be robustly valued due to data limitations.	
Ecosystem services and physical flows	4.1, 4.2: Identify material ecosystem services and beneficiaries/ users; Measure physical ecosystem service flows	ENCORE, Science Based Targets Network tools, Farmax*, ETS carbon modelling resources, Treasury valuation guidance, internal valuation models	Pāmu identified and valued five initial ecosystem services: grazed biomass, timber production, water supply, climate regulation through carbon storage, and habitat maintenance and biodiversity. These services were selected through a structured materiality assessment because they were relevant to farming and forestry operations, represented material dependencies and opportunities, and had credible data and valuation methods available.	

**FarmIQ and Farmax are cloud-based farm management tools utilised to manage on-farm performance.*



4.5.3 Fletcher Living LowCO

Degree of alignment with SEEA EA methodology Yes No Partial

Relevant SEEA EA Phase	Relevant Methodology Steps	Tools utilised (if any)	Application within this case study	Degree of alignment
Boundary and units	1.1 Define Ecosystem Accounting Area and reporting boundary		The direct boundary was described as lot-based, with broader relevance to future biodiversity consideration at a wider development scale, but the document does not indicate that a formal Ecosystem Accounting Area or reporting boundary was defined.	
	1.2, 1.3 Delineate ecosystem assets and basic spatial units; Classify ecosystem assets by ecosystem type	Garden Star, design and landscape assessments	The pilot identified landscape features such as permeable surfaces, planting, habitats, fruiting trees and vines, but it did not show formal delineation of ecosystem assets, basic spatial units, or classification by ecosystem types.	
Extent account	2.1 Compile Ecosystem Extent account		The pilot considered landscape design, permeability and biodiversity-supporting features, but there is no evidence that an ecosystem extent account was compiled or that ecosystem assets were spatially quantified in the form of an extent account.	
Condition account	3.1 Select Ecosystem Condition characteristics and variables	Garden Star, Homestar v5, Passive House Planning Package, custom monitoring platform	The pilot used landscape-related biodiversity proxies, including ecological value, permeability, planting sequestration, material toxicity, food production and carbon intensity, but these were design and performance indicators rather than a formal ecosystem condition account. Benchmarks and tools were utilised to create reference levels, but formal ecosystem baselines were not established. Indicators identified included stormwater management, food production, biodiversity-supporting habitat, water savings and resident comfort.	
	3.2 Define reference levels and calculate condition indicators/indices			
Ecosystem services and physical flows	4.1, 4.2: Identify material ecosystem services and beneficiaries/ users; Measure physical ecosystem service flows	Garden Star, custom monitoring platform	The pilot considered ecosystem service-related outcomes such as stormwater management, water savings, landscape carbon sequestration, food production and biodiversity-supporting habitat. However, formal materiality thresholds were not established, and the project did not directly measure ecosystem service flows or ecological outcomes such as species abundance, soil health or habitat condition.	

How well is SEEA aligned with the New Zealand context?

Overall, the case studies suggest that SEEA is strongly aligned with New Zealand's environmental, operational and reporting context, with the main challenge being data availability rather than the framework itself.

Comparable approaches to determining reporting boundaries, identifying material natural assets and ecosystem services indicate that New Zealand entities are adopting a methodical, empirical approach that will support verification and assurance. This will be key to driving broader uptake and instilling investor confidence in the future.

Key findings:

- Strong alignment on ecosystem boundaries and extent accounting, with organisations already using catchment-based and spatial approaches consistent with SEEA.
- Strong alignment on ecosystem services, with organisations assessing nature-related dependencies, risks and opportunities that mirror SEEA concepts.
- Condition accounting is the weakest area, largely due to incomplete or inconsistent biodiversity, soil and water data.
- New Zealand businesses tend to adopt a materiality lens, focusing on the ecosystem services most relevant to decision-making rather than compiling comprehensive ecosystem accounts.

Conclusion

New Zealand's economy depends on nature. More than four-fifths[71] of export earnings are linked to Natural Capital, yet the condition of the ecosystems that underpin productivity, resilience and future growth remains only partially visible within lending decisions, investment valuations and risk assessments. As biodiversity loss, water stress and ecosystem degradation become increasingly recognised as economic and financial risks, the ability of organisations and financial institutions to understand their exposure to nature is becoming strategically important.

This report highlights the emergence of a more coherent Natural Capital Accounting system. While a range of frameworks, standards and tools are currently in use, they are increasingly serving complementary roles rather than competing ones. The assessment of the case studies found strong alignment between New Zealand practice and the SEEA Ecosystem Accounting framework, suggesting SEEA provides a credible measurement foundation capable of bringing consistency, comparability and transparency to Natural Capital information. The principal challenge is not methodological fit, but the availability of robust ecosystem condition data.

The case studies demonstrate that Natural Capital Accounting is emerging as a practical mechanism for closing this information gap. Organisations are already using ecological, spatial and operational data to identify material dependencies, understand ecosystem condition, and inform planning, investment and risk management decisions.

Importantly, the findings show that organisations do not need perfect data to begin. In each case, the process itself improved understanding of the natural systems that underpin long-term value creation and highlighted priorities for future action.

For banks, investors and insurers, natural capital information is valuable because it provides insight into management capability, governance maturity, resilience and preparedness for future risks. An understanding of nature-related risks is likely to become increasingly relevant to lending, investment and prudential supervision over time. In this regard, Natural Capital Accounting can help ensure that nature dependencies and exposures are more systematically, and consistently, incorporated into financial decision-making. As it becomes more mainstream, Natural Capital Accounting has the potential to improve capital allocation decisions, strengthen economic resilience and support the sustainable growth of an economy that remains fundamentally dependent on the health and condition of its natural capital base.

Endnotes

1. Heagney et al., Agricultural Systems, 2026. Natural capital enhances farm production, profitability and financial resilience: findings from a study on 230,000 ha of farmland in Australia.
2. Ministry for the Environment. 2025. 2. Land. Our environment 2025 Tō tātou taiao. Publications.
3. Ministry for the Environment, & Stats NZ. 2026. Our Freshwater 2026 – Tō Tātou Wai Māori: New Zealand's Environmental Reporting Series. Ministry for the Environment and Stats NZ.
4. Rabobank. 2026. New Zealand retains spot as world's largest single-country dairy exporter – Rabobank world dairy map 2026.
5. Ministry for Primary Industries [MPI]. 2026. Situation and outlook for primary industries. Ministry for Primary Industries Economic Intelligence Unit.
6. Auckland Council. 2020. About the built environment priority. Te Tāruke-ā-Tāwhiri: Auckland's Climate Plan.
7. Ministry of Business Innovation and Employment 2025 - National Construction Pipeline Report 2025. World Business Council for Sustainable Development.
8. World Economic Forum. 2025. Nature Positive: Corporate Assessment Guide for Financial Institutions, p05
9. Visentin, G.A. 2026. Financial risks of biodiversity loss: A review
10. Agarwala, M., Burke, M., Klusak, P., Kraemer, M., Volz, U., & Sovacool, B. K. 2026. Biodiversity loss will decrease the future creditworthiness of nations. Nature Ecology & Evolution, 1-10.
11. United Nations Development Programme. 2026. Designing Insurance for Nature: A Practical Guide.
12. United Nations Development Programme. 2024. Nature-in-surance Nexus: Results of SIF Survey on Nature-related Risks, New York.
13. Agarwala, M., et. al. 2026. See footnote 10
14. Reserve Bank of New Zealand. 2025. Registered banks and non-bank lending institutions: Sector lending C5. Lending and monetary statistics.
15. Barker, R., & Mayer, C. 2025. Seeing double corporate reporting through the materiality lenses of both investors and nature. Accounting Forum, 492, 259-289.
16. Network for Greening the Financial System. 2026. NGFS 2026 Nature Package.
17. International Sustainability Standards Board. 2026. Nature-related disclosures, ISSB Update 2026
18. United Nations System of Environmental Economic Accounting. 2024. Ecosystem Accounting.
19. Te Tai Ōhanga The Treasury. 2018. The Start of a Conversation on the Value of New Zealand's Natural Capital
20. United Nations System of Environmental Economic Accounting. 2014. SEEA Central Framework.
21. Taskforce on Nature-related Financial Disclosures. 2026 Glossary. Version 6.0, July 2026
22. Macdoch Foundation, La Trobe University and Vizzuality, 2024. Natural Capital Primer
23. Haines-Young, R. & Potschin, M. 2018. Common International Classification of Ecosystem Services CICES V5.1: Guidance on the Application of the Revised Structure. European Environment Agency.
24. Capitals Coalition. 2020. Natural capital for biodiversity policy: what, why and how
25. Deloitte, Bank of New Zealand and The Nature Conservancy, 2026. Connecting nature, climate, and capital.
26. Vardon, M. J., Keith, H., Burnett, P., & Lindenmayer, D. B. 2021. From natural capital accounting to natural capital banking. Nature Sustainability, 410, 832-834.
27. Te Tai Ōhanga The Treasury. 2018. Natural Capital and the Living Standards Framework. speech by Makhlouf, Gabriel.
28. United Nations Environment Programme. 2026. Ecosystem restoration. Conservation, Restoration and Sustainable Use.
29. Durante, L. M., Beentjes, M. P., & Wing, S. R. 2020. Shifting trophic architecture of marine fisheries in New Zealand: Implications for guiding effective ecosystem-based management. Fish and Fisheries, 214, 813-830.

30. Charles Patrick Lavin, Daniel Pauly, Donna Dimarchopoulou, Cui Liang, Mark John Costello, 2023. Fishery catch is affected by geographic expansion, fishing down food webs and climate change in Aotearoa, New Zealand. PeerJ.

31. The Aotearoa Circle, 2026. Natural Infrastructure Plan, Part 3: Case studies. Demonstrating the fiscal and economic case for natural infrastructure through leading practice case studies. Case study 1: Kaipara Moana Remediation.

32. United Nations. n.d. Natural Capital and Ecosystem Services FAQ. System of Environmental Economic Accounting.

33. World Bank. 2024. Harnessing Biodiversity: Integrating Natural Capital Accounting for a Sustainable Future

34. Ngā Ture o Aotearoa New Zealand Legislation. 2020. Public Finance Wellbeing Amendment Act 2020.

35. Stats NZ. 2025. Environmental-economic accounts: Data to 2023

36. Te Tai Ōhanga The Treasury. 2025. CBAx Tool Spreadsheet Model - October 2025

37. Te Tai Ōhanga The Treasury. 2021. The Living Standards Framework LSF

38. Tokdede, O. Olubukula et al. 2022. Harmonising life cycle sustainability thinking in material substitution for buildings.

39. The Aotearoa Circle. 2026. Natural Infrastructure Plan, Part 3: Case studies. Demonstrating the fiscal and economic case for natural infrastructure through leading practice case studies. Case study 4: South-West Christchurch, Resilient Urban Development.

40. Higham, C. D., Singh, R., & Horne, D. J. 2024. The Water Footprint of Pastoral Dairy Farming: The Effect of Water Footprint Methods, Data Sources and Spatial Scale. Water, 163, 391

41. ibid footnote 40.

42. ibid footnote 40.

43. United Nations Statistics Division UNSD. 2026. Results of the 2025 Global Assessment of Environmental-Economic Accounting and Supporting Statistics

44. United Nations Statistics Division UNSD. 2026. Results of the 2025 Global Assessment of Environmental-Economic Accounting and Supporting Statistics.

45. Natural Capital Coalition. 2016. Natural Capital Protocol.

46. International Union for Conservation of Nature [IUCN]. 2016. Natural Capital Protocol launched today.

47. Smith et al. 2023. The Natural Capital Handbook: A practical guide to corporate natural capital accounting, assessment, risk assessment and reporting.

48. Te Tai Ōhanga The Treasury. 2021. The Living Standards Framework 2021.

49. Te Tai Ōhanga The Treasury. 2025. The Treasury's CBAx Tool.

50. Taskforce on Nature-related Financial Disclosures. 2023. Guidance on the identification and assessment of nature related issues: The LEAP approach

51. Taskforce on Nature-related Financial Disclosures. 2026. TNFD Adopters.

52. Science Based Targets Network 2026. Corporate Manual for setting science-based targets for nature.

53. Science Based Targets Network. 2025. September 2025 Newsletter.

54. Lloyd, S. 2026. Global developments in sustainability disclosures. Delivered at 'Exclusive international update on climate and nature disclosures with ISSB, XRB and SEEA' on 13th August 2026.

55. Taskforce on Nature-related Financial Disclosures. 2026. What is the TNFD?

56. Taskforce on Nature-related Financial Disclosures. 2026. TNFD Adopters.

57. United Nations Development Programme. 2026. see footnote 11.

58. United Nations System of Environmental Economic Accounting. 2014. See footnote 20.

59. Commonwealth Scientific and Industrial Research Organisation [CSIRO]. 2024. The natural capital handbook: A practical guide to corporate natural capital accounting, impact, dependency and risk/opportunity assessment and reporting. CSIRO.

60. United Nations System of Environmental Economic Accounting. 2024. See footnote 18.

61. United Nations. n.d. Global Assessment of Environmental Economic Accounting. System of Environmental Economic Accounting

62. United Nations Economic Commission for Europe [UNECE]. 2026. SEEA Implementation around the World and updates from the UNSC. [PowerPoint slides].

63. United Nations, European Commission, Food and Agricultural Organization of the United Nations, International Monetary Fund, Organization for Economic Co-operation and Development, & World Bank. 2017. "Chapter I. Introduction to the SEEA Central Framework". In System of Environmental-Economic Accounting 2012. USA: United Nations.

64. United Nations, European Commission, Food and Agricultural Organization of the United Nations, International Monetary Fund, Organization for Economic Co-operation and Development, & World Bank. 2017. "Chapter I. Introduction to the SEEA Central Framework". In System of Environmental-Economic Accounting 2012. USA: United Nations.

65. Stats NZ 2018. Environmental-economic accounts: Sources and methods

66. Stats NZ 2026. Environmental-economic accounts: Data to 2024.

67. United Nations Department of Economic and Social Affairs Statistics Division [UN Statistics Division]. 2022. Business accounting and the SEEA Area E: Summary of activities Paper prepared by the Chair and Secretariat of the Business Accounting Working Group. United Nations Committee of Experts on Environmental-Economic Accounting.

68. Taskforce on Nature-related Financial Disclosures. 2023. Guidance on the identification and assessment of nature-related issues: The LEAP approach. Version 1.1. TNFD.

69. International Financial Reporting Standards [IFRS]. 2025. ISSB welcomes TNFD's support as it advances nature-related disclosures.

70. Taskforce on Nature-related Financial Disclosures. n.d. Exploring Natural Capital Opportunities, Risks and Exposure.

71. Ministry for Primary Industries. 2026. See footnote 5.

Glossary

Glossary

Terms	Description
Abiotic stocks	Non-living components of Natural Capital, such as minerals, fossil fuels, water bodies and atmospheric gases.
Basic spatial unit	The smallest mapped unit used to organise, classify or measure ecosystem assets within an accounting area.
Biodiversity	The variety of living organisms, species, habitats and ecosystems, and the ecological relationships between them.
Biodiversity-positive	An ambition or outcome where actions contribute to improving biodiversity outcomes over time.
Biotic stocks	Living components of Natural Capital, such as forests, wildlife, fish populations and soil microorganisms.
Built environment:	The built environment includes: the buildings where we live, work and learn; the infrastructure systems that enable the region to function; the urban spaces that shape our cities.
Carbon sequestration	The capture and storage of carbon dioxide from the atmosphere. This works in two ways: 1. Natural sequestration (through plants and trees, soils, oceans); 2. Technological sequestration
Carbon storage	A process by which carbon dioxide is captured and held in natural ecosystems.
Catchment	A geographic area where water flows into a common water body, such as a river, lake or estuary.
Climate regulation	Ecosystem processes that influence climate conditions, including carbon storage, carbon sequestration and temperature regulation.
Condition	The reliability of natural assets and capacity to continue providing healthy ecosystems.

Terms	Description
Condition indicator	A metric or rescaled value used to assess the quality, state or health of an ecosystem asset.
Dependencies	The ways an organisation relies on Natural Capital or ecosystem services to operate and generate revenue.
Ecosystem Accounting Area (EAA)	The spatial area for which information about ecosystem assets and ecosystem services is compiled.
Ecosystem asset	A specific ecosystem, such as a forest, wetland, harbour, riparian area or quarry habitat, that can be measured in terms of extent, condition and services.
Ecosystem condition	The quality, health or integrity of an ecosystem asset.
Ecosystem condition accounts	Accounts that track the health or quality of ecosystem assets over time.
Ecosystem extent	The physical size or area covered by an ecosystem asset, generally measured spatially, such as in hectares.
Ecosystem services	The direct and indirect benefits that ecosystems provide to people and the economy.
Environmental asset	A naturally occurring living or non-living component of the environment that can provide benefits to people, organisations or the economy.
Environmental externality	An environmental cost or benefit of an activity that is not fully reflected in market prices or traditional financial accounting.
Extent accounts	A record that measures the physical area encompassed by different ecosystem types within a specific geographic boundary over a defined accounting period.

Glossary

Terms	Description
Financial material	An item is material if its omission, disclosure method, or treatment would likely influence decisions made by primary users given surrounding circumstances.
Flows	The benefits or services generated over time by Natural Capital stocks.
GIS	Geographic Information System; a digital platform used to map, analyse and interpret spatial data.
Land-use change	The process of human activity transforming the way land is managed or purposed.
Licence to operate	The ongoing acceptance or approval of an organisation's activities by regulators, investors and other stakeholders.
Monetary valuation	The process of assigning a monetary value to natural assets, ecosystem services, impacts or dependencies.
Natural asset	A component of Natural Capital, such as freshwater, soils, forests, wetlands, biodiversity, minerals or marine ecosystems.
Natural capital	The stock of natural resources and environmental assets
Natural capital account	A structured account that records information about natural assets, their condition, extent, service flows and, where relevant, monetary or non-monetary value.
Natural Capital Accounting	A structured method for measuring changes in the stock, extent and condition of natural assets and the ecosystem services they provide, using physical and/or monetary terms to support decision-making.
Natural capital balance sheet	An organisation-level representation of natural assets, ecosystem condition and associated values, used to understand how nature contributes to business performance, risk and resilience.

Terms	Description
Nature valuation	The process of assessing the value of Natural Capital, ecosystem services or environmental outcomes, using monetary or non-monetary methods.
Nature-based solutions	Actions that protect, restore or manage ecosystems to address societal, environmental or economic challenges, such as flood mitigation, water quality or climate resilience.
Nature-positive	A global goal that aims to stop and reverse biodiversity loss.
Nature-related risks	Potential risks and financial losses to businesses, economies, and societies caused by a decline of Natural Capital.
Non-renewable Natural Capital	Finite Natural Capital stocks that do not regenerate on human timescales, such as minerals and fossil fuels.
Physical flows	A non-monetary measure of an ecosystem service.
Reference condition	The natural baseline used as an ecological or environmental benchmark.
Reference level	A specific baseline or quantitative threshold against which ecosystem condition is assessed.
Remote sensing	The collection of environmental or spatial information from satellites, aircraft, drones or sensors.
Renewable natural capital	Natural Capital stocks that can regenerate over time if managed sustainably.
Reporting boundary	The organisational, geographic, operational or temporal scope used to determine what is included in an assessment or account.
Riparian land	Land located alongside rivers, streams, wetlands or other water bodies.
Sediment retention	The ability of natural landscapes to capture or reduce sediment movement into waterways or coastal environments.

Glossary

Terms	Description
Spatial analysis	The use of geographic, mapping and location-based data to understand ecosystem assets, boundaries, condition, dependencies and risks.
Stocks	The underlying inventory of natural resources or environmental assets.
Stormwater filtration	The process by which pollutants, sediment or nutrients are filtered from stormwater.
System of Environmental-Economic Accounting – Ecosystem Accounting (SEEA EA)	SEEA's Ecosystem Accounting (EA) branch provides an integrated statistical framework for organising ecosystem data, quantifying ecosystem services, monitoring ecosystem condition and extent, and linking environmental information with economic and social activity.
System of Environmental-Economic Accounting (SEEA)	A globally recognised statistical framework that provides guidance on integrating economic and environmental information, enabling informed decision-making and supporting the assessment of environmental conditions.
System of National Accounts (SNA)	The global standard for organising, measuring, and reporting economic activity across countries - including key metrics such as GDP.
Taskforce on Nature-related Financial Disclosures (TNFD)	A set of disclosure recommendations that supports businesses in transitioning towards nature-positive outcomes. They enable organisations to identify, assess, report, and act on their nature-related impacts, risks, and opportunities by integrating nature into decision-making.
Kaitiakitanga	A Te Ao Māori concept referring to guardianship, stewardship and responsibility to care for the natural environment.

Terms	Description
Mauri	A Te Ao Māori concept referring to the life force or vitality of people, ecosystems and natural resources.
Whakapapa	A Te Ao Māori concept referring to genealogy, relationships and interconnectedness between people and the natural world.
Mana whenua	Māori groups with customary authority over land or a specific area.
Mana moana	Māori groups with customary authority over coastal or marine areas.
Taonga	Something treasured or valued, including natural resources such as water.
Te Ao Māori	The Māori worldview, including cultural values, knowledge systems, relationships and responsibilities.

Appendix A

The tables below set out the detailed process for applying the SEEA Ecosystem Accounting framework to value nature.

They outline the activities required at each stage, suggested approaches for completing those activities, and the evidence that may be necessary to substantiate and support the outputs produced. *Click here to go back to SEEA process overview.*

Phase	Methodology step	What you need to do	How you do it	Evidence expectation
1. Mobilise and scope	1.1 Define decision-use case and target users	**Clarify** why you are using *System of Environmental-Economic Accounting – Ecosystem Accounting (SEEA EA)*, by defining the use case. Some examples of use cases are as follows: Business case for project appraisal, policy design, land-use planning, developing a corporate natural capital account, natural capital management, environmental management, restoration planning, investment appraisal. The use case will determine the boundary of your natural capital accounts. It will also inform the materiality, the stocks and flows (ref. step 1.2-2.1) and the data required to perform the accounting.	**Establish** the use case, first prioritise material activities, and their dependencies on geographic locations and ecosystems. Examples of material activities include: agriculture, forestry, energy generation, fisheries, infrastructure development, tourism, mining, urban development, and public-sector planning. **Agriculture:** Material activity: Beef farming. Dependency: Soil quality and water availability. Impact: Soil compaction, pasture condition, topsoil loss. **Energy:** Material activity: Hydro generation. Dependency: rainfall; land availability for damming. Impact: ability to generate power; biodiversity loss due to flooding valley. What could be measured: Flow regime changes, fish passage, freshwater habitat condition, sediment movement, water quality.	**Documentation and records** should demonstrate the structured process undertaken to define the use case, ensuring alignment with organisational priorities and external requirements. These items should show that the use case has been clearly articulated, justified, and formally agreed. **Examples include:** • Approved project charters and initiation documents. • Outputs from stakeholder workshops and consultations. • Stakeholder mapping and engagement records. • Defined use-case prioritisation or hierarchy frameworks. • Maintained decision logs and rationale documentation. • Scope and governance approval records. • Evidence of alignment with policy, strategy, reporting, regulatory, or assurance drivers.

The tables below set out the detailed process for applying the SEEA Ecosystem Accounting framework to value nature.

They outline the activities required at each stage, suggested approaches for completing those activities, and the evidence that may be necessary to substantiate and support the outputs produced. *Click here to go back to SEEA process overview.*

Phase	Methodology step	What you need to do	How you do it	Evidence expectation
1. Mobilise and scope	1.2 Select account modules and maturity pathway	**Establish** ecosystem extent (size of an ecosystem asset) and ecosystem condition accounts first, before progressing to ecosystem service flow accounts and monetary ecosystem asset accounts (biophysical information on the condition of the ecosystem). **Implement** accounts in phases, as the System of Environmental-Economic Accounting – Ecosystem Accounting (SEEA EA) framework is modular and supports progressive development. This approach allows organisations to build data, methods, and capability over time, while delivering early insights to inform decision-making.	**Recommended phased pathway:** 1. Establish the spatial boundary and confirm the ecosystem types in scope. 2. Confirm data sources and data completeness, including identifying any data gaps and clarifying whether suitable proxy indicators can be used to address those gaps. 3. Apply clear attribution boundaries to enable the development of your entity-level Natural Capital account, factoring in common considerations, such as: • your organisational influence on ecosystems you do not directly own (e.g. supplier-managed forests). • your dependence on shared ecosystem assets (e.g. catchments used by multiple parties). • supply-chain impacts generated beyond your direct operational boundary (e.g. upstream water use or land conversion). 4. Select ecosystem condition variables for each ecosystem type, such as water quality, soil condition, vegetation cover, habitat connectivity, species presence or invasive species. 5. Define reference levels or benchmarks so condition can be assessed consistently. 6. Calculate condition indicators and document the assumptions, limitations, data quality and evidence used.	Evidence should demonstrate that implementation decisions are meaningful, justified, and adaptable over time. **Examples include:** • Defined implementation roadmaps and delivery plans. • Documented module selection and prioritisation analyses. • Maintained registers of excluded or deferred accounting components. • Documented external data dependencies and risk assessment. • Formal feasibility and capability assessments reports. • Readiness assessments for monetary valuation, where applicable.

The tables below set out the detailed process for applying the SEEA Ecosystem Accounting framework to value nature.
They outline the activities required at each stage, suggested approaches for completing those activities, and the evidence that may be necessary to substantiate and support the outputs produced. *Click here to go back to SEEA process overview.*

Phase	Methodology step	What you need to do	How you do it	Evidence expectation
2. Boundary and units	2.1 Define ecosystem accounting area (EAA) and reporting boundary	**Define** the ecosystem accounting area. This could be anything from a city or region to a river catchment, project site, operational area, or the locations linked to a supply chain.	**Specify** which spatial areas are included within the boundary ecosystem accounting area and reporting boundary. This should clearly distinguish whether the assessment covers owned or managed land, operational sites, project areas, concessions, catchments, supply-chain regions, customer or user locations, public land, protected areas, or policy jurisdictions, depending on the use case. **Examples of application:** • Agricultural operations may include both managed land and associated catchments. • Infrastructure or energy projects may include project sites and adjacent ecological zones. • Corporate reporting may extend beyond operations to include supply-chain geographies where material impacts occur.	**Maintain** a structured evidence base to support the definition, validation, and traceability of boundaries. **This may include:** • A documented boundary methodology. • Supporting Geographic Information System (GIS) shapefiles or spatial layers. • A defined geocoding methodology. • Asset/activity-to-location mapping files. • An exception log for unresolved locations or data. • Formal approval records confirming boundary governance.
2. Boundary and units	2.2 Delineate ecosystem assets and basic spatial units	**Clearly define and document** ecosystem assets as spatial areas representing ecosystem types. Ecosystem assets are defined as spatial areas representing distinct ecosystem types (distinct set of abiotic and biotic components and their interactions). Within a defined Ecosystem Accounting Area (EAA), these assets should, to the extent feasible, be both exhaustive (collectively covering the full area) and mutually exclusive (clearly delineated without overlap) to ensure consistency and completeness in measurement.	**Map** organisational or policy-relevant areas against ecosystem assets (i.e. forests, wetlands, grasslands, croplands, rivers, lakes, coastal and marine systems, urban ecosystems, and protected areas) to identify where operations or governance boundaries interact with key ecological features.	**Evidence may include, but is not limited to:** • Asset registers. • Supporting Geographic Information System (GIS) layers and spatial datasets. • Metadata outlining data sources, assumptions, and processing steps. • Classification crosswalks to align local and international ecosystem typologies. • Documented delineation rules and methodologies • Quality assurance (QA) logs. • Expert review and formal sign-off records.

The tables below set out the detailed process for applying the SEEA Ecosystem Accounting framework to value nature.
They outline the activities required at each stage, suggested approaches for completing those activities, and the evidence that may be necessary to substantiate and support the outputs produced. *Click here to go back to SEEA process overview.*

Phase	Methodology step	What you need to do	How you do it	Evidence expectation
2. Boundary and units	2.3 Classify ecosystem assets by ecosystem type	**Classify** each ecosystem asset using a consistent ecosystem taxonomy. Where national classifications are applied, align them with international frameworks such as System of Environmental-Economic Accounting – Ecosystem Accounting (SEEA EA) and the International Union for Conservation of Nature Global Ecosystem Typology (IUCN GET) to ensure comparability. This classification should be supported by ecosystem condition indicators, indices, and reference benchmarks to enable consistent assessment and rating of ecosystem health.	**Map** ecosystem types to the entity's activities, assets, dependencies, and associated impacts to enable structured assessment of environmental interactions. This mapping should be supported by the selection of relevant indicators that reflect ecosystem condition and service flows. Confirm your ecosystem map incorporates business attribution considerations (see steps 1.1) with defined operational and value-chain boundaries, separating control from influence, the application of robust allocation methods to shared ecosystem assets and services. **Examples include but are not limited to:** • Agricultural entities linking pasture ecosystems to livestock production and associated soil and water impacts. • Property developers mapping green and blue infrastructure within sites to track land-use change and habitat condition. • Energy operators linking freshwater or geothermal ecosystems to generation assets to assess hydrological and ecological impacts.	**Evidence** documentation should contain data outputs that support and validate ecosystem classification and delineation, ensuring that each step in the process is internally consistent and mutually reinforcing. **Evidence may include, but is not limited to:** • A classification dictionary or recognised taxonomy. • Crosswalk tables for harmonisation across frameworks. • Spatial outputs such as ecosystem type maps. • Confidence rating datasets. • Validation and testing results. • Expert review and sign-off records.

The tables below set out the detailed process for applying the SEEA Ecosystem Accounting framework to value nature.

They outline the activities required at each stage, suggested approaches for completing those activities, and the evidence that may be necessary to substantiate and support the outputs produced. *Click here to go back to SEEA process overview.*

Phase	Methodology step	What you need to do	How you do it	Evidence expectation
3. Extent account	3.1 Compile ecosystem extent account	**Identify** ecosystem extent account (size of an ecosystem asset) measurement areas for each ecosystem type at the beginning (opening area) and end (closing area) of a reporting period within the defined boundary. Track changes such as expansion, loss, and conversion between ecosystem types, helping to show whether ecosystems are growing, shrinking, or changing in nature over time.	**Compile** the ecosystem extent account (size of an ecosystem asset) by recording the area at the beginning (opening area) and end (closing area) of each ecosystem type within the defined accounting boundary. The account should provide a complete spatial picture where possible. For entity-level analysis, key additions, reductions and ecosystem conversions should then be interpreted in relation to the entity's primary or material business activities.	Evidence should support the compilation and validation of ecosystem extent accounts, ensuring consistency with System of Environmental-Economic Accounting – Ecosystem Accounting (SEEA EA) extent accounting requirements and SEEA Central Framework asset account structures. This evidence should demonstrate that calculations, classifications, and reconciliations are internally consistent and mutually reinforcing across the workflow. **Examples may include:** • Structured extent account table and supporting documents. • Ecosystem conversion/change matrices files. • Supporting Geographic Information System (GIS) derived calculations and spatial outputs. • Source imagery and mapping layers. • Defined and documented conversion and classification rules. • Outputs showing reconciliation to total Ecosystem Accounting Area (EAA) coverage. • Documented Quality Audit (QA) and validation review notes.

The tables below set out the detailed process for applying the SEEA Ecosystem Accounting framework to value nature.

They outline the activities required at each stage, suggested approaches for completing those activities, and the evidence that may be necessary to substantiate and support the outputs produced. Click here to go back to SEEA process overview.

Phase	Methodology step	What you need to do	How you do it	Evidence expectation
4. Condition account	4.1 Select Ecosystem Condition characteristics and variables	**Define** reference levels or benchmarks. The benchmark is fundamental when making comparisons of condition over time and across ecosystem types. Justify the reference condition choice and sensitivity to that choice. **Determine** ecosystem condition account characteristics and variables. Ecosystem condition accounts measure ecosystem quality using a combination of abiotic (physical and chemical), biotic (biological), and landscape-level characteristics. Variables should be selected based on their relevance, sensitivity to environmental change, scientific validity, and feasibility of consistent measurement. **Compile** data from established environmental information sources, such as Geographic Information System (GIS) datasets, monitoring networks, publicly available databases, and ecological surveys. **Identify** gaps or areas of uncertainty, these should be addressed through expert judgement, supplementary modelling, or targeted field data collection.	**Select** variables that capture ecosystem integrity and align with management and decision-making needs. Relevant indicators may include water quality and availability, soil condition, vegetation cover, habitat fragmentation, species abundance, invasive species, fire risk, erosion processes, and ecosystem functionality.	**Evidence** should support the selection, definition, validation, and application of ecosystem condition variables, ensuring that outputs are relevant, scientifically robust, and mutually reinforcing across all stages of the process. **This may include:** • Documentation on variable selection matrices linking indicators to ecosystem characteristics and management objectives. • Workshop notes, presentations and records documenting judgements, assumptions and consensus decision. • Data source assessments evaluating quality, coverage, limitations, and suitability. • Policy and management relevance mapping linking variables to decision-making needs. • Variable definitions logs and calculation rules ensuring consistency, transparency, and repeatability.
4. Condition account	4.2 Define reference levels and calculate condition indicators/ indices	**Rescale** variables into indicators using defined reference levels or reference condition benchmarks. Apply transparent and well-documented weighting and aggregation rules when combining indicators into composite indices to ensure consistency and comparability.	**Define** clear condition classes (e.g. high integrity, moderate change, degraded, critical condition) to categorise ecosystem health supporting benchmarking and decision making. **Select and document reference levels (or counterfactuals), including:** • Natural or pristine state (no human interference). • Least-disturbed state (best achievable condition where pristine no longer exists). • Contemporary baseline (current state of the ecosystem). These reference levels can then be used to benchmark ecosystem condition, measure change over time, and ensure comparability across ecosystem types. Apply condition classes and reference points consistently to inform planning, restoration prioritisation, management responses, scenario analysis, and reporting.	**Evidence** should supporting the calculation, aggregation, and interpretation of ecosystem condition indicators on indicator development, reference conditions, aggregation, and uncertainty management. These items should demonstrate that indicator construction and aggregation approaches are transparent, justified, and mutually reinforcing across the workflow. **Examples include:** • Defined reference condition methodologies. • Documented indicator calculation approaches. • Specified aggregation frameworks and models. • Supporting weighting methodologies and justification files. • Sensitivity analysis and scenario outputs documentation. • Recorded uncertainty assessments and notes. • Expert review and sign-off documentation.

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They outline the activities required at each stage, suggested approaches for completing those activities, and the evidence that may be necessary to substantiate and support the outputs produced. *Click here to go back to SEEA process overview.*

Phase	Methodology step	What you need to do	How you do it	Evidence expectation
5.Ecosystem services physical flows	5.1 Identify material ecosystem services and beneficiaries/users	**Define and classify** ecosystem services in line with the System of Environmental-Economic Accounting – Ecosystem Accounting (SEEA EA) framework, ensuring consistency in how benefits are identified and measured. Ecosystem services are defined as the contributions that ecosystems make to benefits used by people and economic activities. The SEEA EA framework categorises these services into provisioning, regulating and maintenance, and cultural services, and further distinguishes final services from intermediate services to ensure consistent accounting and to prevent double counting.	**Map** ecosystem services to their users (beneficiaries) and link them to management and decision-making contexts. Ensure any attribution considerations (see step 1.1) are applied consistently when mapping your ecosystem services. **Relevant services may include:** Provisioning services: crops, timber, fish Regulating and maintenance services: water supply, pollination, flood mitigation, erosion control, climate regulation, air filtration, coastal protection Cultural services: recreation, tourism, and cultural values **Review and confirm that the identified ecosystem extent account, ecosystem condition characteristics, and ecosystem service account ensure that they:** • share the same spatial units, • refer to the same ecosystem accounting area, and • refer to the same reporting period, so that they are reconcilable.	Supporting documentation should support the identification, classification, and validation of ecosystem services, ensuring outputs are consistent and mutually reinforcing across the workflow. **This may include:** • Ecosystem service registers. • Documented materiality assessments identifying priority services. • Service logic chains linking ecosystem functions to benefits and users. • User or beneficiary mapping. • Final and intermediate service classification. • Subject matter expert (SME) review and sign-off documentation.
5.Ecosystem services physical flows	5.2 Measure physical ecosystem service flows	**Record** physical flows (natural inputs from the environment, such as water and energy; and residual flows from the economy to the environment, such as air emissions and solid waste) using consistent units of measurement. Ensure that, for each ecosystem service, total supply equals total use, maintaining accounting consistency. *Note that the Natural Capital account signals degradation only when flow exceeds sustainable capacity. Supply = use is true by accounting convention but does not, in itself, indicate sustainability. Ecosystem capacity reflects the ecosystem's ability to continue providing these services over time without degradation. Comparing actual service flows to the established capacity helps signal overuse and/or highlight limits for sustainable use.*	**Measure** ecosystem services using clearly defined physical metrics. Examples include tonnes of biomass supplied, cubic metres of water retained, hectares benefiting from pollination, and estimated flood damage avoided, depending on the type of service being assessed. **Review and sense-check** the baseline utilised for your quantification process. For provisioning and cultural services, where there is a direct interaction between people and ecosystems, assume a zero-use baseline (i.e. no harvest or no interaction). This ensures that measured flows reflect the actual level of use or benefit above this baseline.	**Evidence** should support the quantification, validation, and reconciliation of ecosystem service flows, ensuring that outputs are transparent, internally consistent, and mutually reinforcing across the workflow. **This may include:** • Physical flow calculation files or models. • Model documentation describing assumptions and methodologies. • Input datasets used in calculations. • Documented baseline definitions and rationale. • Supply–use reconciliation outputs demonstrating balance and consistency. • Quality assurance (QA) logs. • Uncertainty assessments or documentation outlining limitations and confidence levels.

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Phase	Methodology step	What you need to do	How you do it	Evidence expectation
$ **6. Monetary valuation**	6.1 Select valuation basis and methods for service flows	**Apply** exchange values aligned with frameworks to ensure comparability with economic data while recognising that these values do not capture the broader range of benefits provided by nature, including social, intrinsic, cultural, and non-use values.	**Utilise** financial estimates selectively to inform project appraisal, cost-benefit analysis, Natural Capital management, investment decisions, policy development, restoration prioritisation, and reporting. **Consider common pitfalls, including:** • Misalignment between physical and monetary information (e.g. different time periods such as calendar year vs financial year). • Inconsistent accounting boundaries or classifications across datasets. • Incorrect application of valuation methods, including failure to apply exchange values appropriately. • Double counting of ecosystem services, or inadvertently including overlapping or intermediate services. **To address the pitfalls noted above, you may need to clearly define:** • Where and how financial estimates are applied. • Appropriateness of the selected financial estimates in relation to the natural benefits generated within your defined boundaries and timeframe. • Treatment of excluded values, including intrinsic or non-market benefits.	**Evidence** should demonstrate that valuation methods, assumptions, and outputs are justified and consistent across the workflow. **Examples include:** • Formal valuation policies and frameworks. • Documented method selection and justification papers. • Price source registers and reference datasets. • Detailed assumptions and input logs. • Supporting expert reports and technical analyses. • Sensitivity and scenario analysis outputs. • Documented limitations, disclosures, and uncertainty statements.

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Phase	Methodology step	What you need to do	How you do it	Evidence expectation
6. Monetary valuation	6.2 Value ecosystem assets using NPV where appropriate	**Quantify** the value of ecosystem assets as the net present value (NPV) of expected future ecosystem service flows. Document key assumptions, including asset life, expected service flows, price projections, and the discount rate, to ensure consistent and comparable valuation.	**Utilise** financial estimates to inform strategic and analytical purposes, including Natural Capital management, scenario comparison, restoration investment prioritisation, policy evaluation, and tracking changes in ecosystem asset value. Consider common pitfalls outlined in 6.1. Avoid presenting these estimates as a standalone market or legal asset valuation of land, unless specifically supported by robust evidence and appropriate valuation assumptions. Keep financial estimates consistent, clearly bounded and documented.	**Evidence** should demonstrate that valuation methods, assumptions, and outputs are coherent, well-justified, and mutually reinforcing across the workflow. **Examples include:** • Detailed Net Present Value (NPV) models and calculation frameworks. • Documented forecast assumptions and input parameters. • Discount rate methodologies and supporting papers. • Projected ecosystem service flow datasets. • Scenario and sensitivity analysis outputs. • Model validation, testing, and verification documentation. • Analytical decomposition of asset values into component drivers. • Governance, review, and formal approval records.

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Phase	Methodology step	What you need to do	How you do it	Evidence expectation
7. Integration and reporting	7.1 Integrate physical and monetary accounts into combined presentations	**Apply** combined physical and monetary presentations to support the integrated interpretation of economic, operational, and policy activities alongside environmental stocks and flows. Maintain the use of physical data as a foundational input, including in cases where monetary values are developed.	**Develop** dashboards or reporting packs that combine ecosystem metrics with operational and decision-making information. Include extent, condition, service flows, and monetary estimates, alongside asset or activity linkages, location, accountability (owner), trend analysis, confidence levels, and management responses to support monitoring, reporting, and informed decision-making.	**Evidence** should demonstrate that reported outputs are coherent, reconciled, and subject to appropriate governance and review. **Examples include:** • Underlying modelling. • Structured combined presentation tables. • Outputs from dashboards and reporting systems. • Reconciliation records linking ecosystem metrics to activities or assets. • Defined KPI frameworks and calculation methodologies. • Formal reporting packs and disclosure materials. • Documented review processes, comments, and approval records.
7. Integration and reporting	7.2 Link to management, policy, strategy or disclosure processes	**Utilise** the System of Environmental-Economic Accounting (SEEA) to provide a structured measurement framework that supports management decision-making, policy evaluation, sustainability reporting, Taskforce on Nature-related Financial Disclosures (TNFD) - style disclosures, investment appraisal, and restoration planning.	**Map** System of Environmental-Economic Accounting (SEEA) outputs to organisational strategy, policy, and operational processes to ensure environmental information is embedded in the business strategy. This includes linking outputs to capital allocation, procurement, land-use planning, restoration programmes, performance targets, management action plans, and public reporting.	**Evidence** should support the integration of ecosystem accounting into organisational processes, decision making, and stakeholder engagement, ensuring outputs are actionable, traceable, and consistent across the workflow. **This may include:** • Indicator dictionaries defining metrics and calculation approaches. • Policy and process updates incorporating ecosystem accounting outputs. • Assessment templates used for consistent evaluation and decision-making. • Nature and economic heatmaps highlighting priority areas, risks, and opportunities. • Stakeholder engagement logs documenting consultations and feedback. • Committee papers and governance materials supporting oversight and decision-making. • Disclosure mapping tables, where relevant, aligning outputs to reporting requirements (e.g. sustainability or regulatory frameworks).

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Phase	Methodology step	What you need to do	How you do it	Evidence expectation
8. Quality, controls and assurance readiness	8.1 Establish data quality, uncertainty and limitations framework	**Identify** inherent uncertainty in measurement, valuation, and modelling of ecosystem changes and future prices. Address uncertainties by applying transparent, well-documented assumptions and methodologies, enabling users to understand limitations and make informed decisions.	**Establish** confidence ratings for core components such as geocoding accuracy, ecosystem classification, condition indicators, service flows, and monetary estimates. Apply these ratings to determine whether outputs are suitable for external disclosure or internal decision-making, or whether they require further refinement and quality improvement.	Evidence should demonstrate that uncertainty is assessed, documented, and incorporated into analysis and reporting, with pathways for improvement in relevant areas. **Examples include:** • Formal data quality assessment frameworks and outputs. • Maintained uncertainty registers. • Defined confidence scoring approaches and methodologies. • Sensitivity and scenario analysis outputs. • Documented limitations and disclosure statements. • Remediation and continuous improvement plans.
8. Quality, controls and assurance readiness	8.2 Create assurance -ready evidence pack and control framework	**Record and maintain** supporting evidence from the datasets and outputs, even where assurance is not initially applied. This approach enhances credibility, ensures repeatability of methods, and enables future limited or reasonable assurance processes.	**Develop and maintain** an evidence pack that underpins governance, transparency and accountability. This pack should support external assurance, regulatory or funder enquiries, public scrutiny, internal audit, stakeholder challenge, and ensure consistent and repeatable reporting across cycles.	Evidence should support the preparation, documentation, validation, and governance of ecosystem accounting outputs, ensuring results are transparent, traceable, and mutually reinforcing across the reporting process. **This may include:** • Basis of preparation documents outlining scope, methodologies, and key assumptions. • Evidence indices linking outputs to supporting documentation and data sources. • Source data archives maintaining underlying datasets and version control. • Methodology documentation describing approaches, models, and calculation methods. • Calculation files and working papers supporting reported outputs. • Control sign-offs and governance approvals. • Review notes and challenge logs documenting validation and internal review. • Management representation statements confirming completeness, accuracy, and responsibility.

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