Nature's conservation is essential to maintaining the systems and processes that support life on Earth. In an effort to conceptualise nature's value from an economic perspective, the terms natural capital, ecosystem services, and nature-based solutions have begun to permeate the contemporary discourse.

To help investors navigate and employ these increasingly mainstream, and too often conflated, terms, we have put together this summary explaining what they mean and their relevance to the investment community.

**NATURAL CAPITAL**

- **Natural capital** (or ‘natural assets’) is the stock of renewable and non-renewable resources that combine to yield a flow of benefits (ecosystem services) to people. Natural capital comprises two main components: abiotic (non-living) and biotic (living).

- These living and non-living components can include both **individual assets** like minerals, fungi, CO₂, plants and **assets produced through the interaction of these individual components** like clean air, arable land, forests, ecosystems, and biodiversity.

- Natural capital is conceptually similar to other forms of capital like social capital, human capital, financial capital, and manufactured capital: **they are all inputs into economic production**.

**Ecosystem services**

Natural capital and its interactions at a particular location produce ecosystem services.

**Nature-based solutions**

Activities that protect/restore natural capital so that ecosystem services continue to flow.

Figure 1 – relationship between natural capital, ecosystem services & nature-based solutions
• The value of natural capital is determined by its capacity to support and enhance economic production through the goods and services it provides.

• These goods and services are collectively known as ecosystem services.

### In a Nutshell: Natural capital accounting

**Natural capital accounting** is an umbrella term used to describe the process of calculating (in economic terms) the total ‘stock’ of natural capital in a given location. These calculations are performed using a framework of economic and environmental data called the [System of Environmental and Economic Accounts (SEEA)](https://unstats.un.org/unsd/envaccounting/), approved by the United Nations Statistical Commission.

*As of 2017, the Australian Bureau of Statistics estimated the total stock of Australia's natural capital to be **AUS$6.4 trillion** per year*

### ECOSYSTEM SERVICES

Ecosystem services are the services produced by natural capital and their interactions.

- Ecosystem services describe the naturally occurring biological processes that facilitate life and deliver vital services such as pollination, climate regulation, food production and water filtration.

- For example, bees interacting with plants to provide us with pollination, or mangroves protecting coastal communities from storm damage.

#### The four categories of ecosystem services are:

1. **Provisioning services** - raw materials such as timber and fish
2. **Regulating services** - climate regulation by algae producing oxygen
3. **Cultural services** - aesthetic value, Indigenous heritage value and tourism value
4. **Supporting services** - waste absorption, nutrient cycling, and decomposition

### In a nutshell: The state of natural capital and ecosystem services

- As of 2011, the global value of ecosystem services was estimated to be **US$125-145 trillion/yr**
- Between 1992-2014 we lost approximately 40% of the natural capital that underpins these services
- Today, ecosystem services are declining at a rate of **US$5 trillion/yr**
- More than half the world’s GDP, or **US$44 trillion** is classified as moderately to highly dependent on nature
- This rapid decline is generating significant sources of financially material risk for those sectors most exposed, such as agriculture, food & beverage, and construction

### NATURE-BASED SOLUTIONS

**Nature-based solutions are defined by the International Union for Conservation on Nature (IUCN) as “...actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits”**.
They include:

- Biological carbon sequestration
- Coastal/aquatic management
- Land/forest restoration

Nature-based solutions are being implemented across the globe to address some of the most significant socio-environmental challenges of our time (like climate change). More recently, organisations are implementing nature-based solutions in an effort to protect and enhance the ecosystem services on which their businesses operations are dependent.

**In a nutshell: Drivers of biodiversity loss and ecosystem change**

- In its simplest of terms, biodiversity is the richness of life on Earth; the living component of natural capital and ecosystem services (plants, animals, fungi and bacteria).
- Ecosystems with high levels of biodiversity produce more ecosystem services (because they are richer in natural capital), and are more resilient than non-diverse ecosystems.
- By protecting and enhancing biodiversity (such as through employing nature-based solutions), we are safeguarding the stock of natural capital for future generations.
- Drivers of biodiversity loss can be direct or indirect. Key direct drivers include invasive species, land/sea use change, pollution, climate change, and the direct exploitation of organisms.
- Indirect drivers often influence direct drivers, for example, demographic change might result in increased meat consumption, which may in turn lead to land clearing and deforestation for cattle grazing. This relationship is illustrated in figure 2 below.

*Figure 2: Infographic found in the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) summary paper for policymakers of the global assessment report on biodiversity and ecosystem services. Figure illustrates the relationship between indirect and direct drivers of ecosystem change, leading to the degradation and loss of biodiversity and other natural assets (see key statistics on the right) that generate ecosystem services.*
INVESTOR RELEVANCE - RISK

Investors are exposed to risk through the companies in their portfolios. Based on the dependencies and impacts of those companies on ecosystem services, financially material risks may arise if those ecosystem services are compromised. This risk can be:

- **Physical** - e.g. a physical asset destroyed by a storm
- **Transition** - e.g. bans on products that harm nature, leading to new product innovation
- **Systemic** - e.g. deforestation leading to reduced rainfall, thus impacting the agricultural industry

![Figure 3: Summary table illustrating how natural capital and ecosystem services are relevant from a risk perspective, with risks manifesting in six main ways for investors.](image)

INVESTOR RELEVANCE - OPPORTUNITY


Capturing this opportunity is forecasted to require **$2.7 trillion in investment**. This investment capital will need to flow into:

- **Emerging markets** where dependency on natural capital is high and governance is lacking
- **New technologies** that support the transition to a nature-positive economy
- **Companies reporting** their nature-related risk and impacts
- **Companies implementing** sustainable practices and technologies
- **Financial instruments** with nature positive outcomes

INVESTOR ACTION - CAUSE

For investors looking to take the next step, here are five key actions (CAUSE):

1. **Collaborate** with global and local initiatives
2. **Advocate** for your institutions to act on more nature conservation activities
3. **Use** sustainable investment techniques
4. **Shift** investments into sustainability focused industries or assets
5. **Educate** yourself
RECOMMENDED READINGS AND INITIATIVES

Biodiversity, natural capital, ecosystem services & nature-based solutions

- The Biodiversity Crisis is a Business Crisis
- Corporate Natural Capital Accounting
- Natural Capital Protocol: Business Primer
- Exploring Natural Capital Risks, Opportunities & Exposures
- Biodiversity: Unlocking Natural Capital Value for Australian Investors
- World Bank: Mobilising Private Finance for Biodiversity & Ecosystem Services
- IUCN Work on NBS and Ecosystem Services
- Market Review Of Nature-Based Solutions Ecosystem Services: Key Concepts and Applications (AU Gov)

New Zealand context

- Ecosystem Services and New Zealand's Wellbeing
- New Zealand Institute for Economic Research: Capturing Natural Capital in Decision Making
- Sustainable Business Council: Corporate Ecosystem Services Review - Case Studies & Insights
- The Total Economic Value of New Zealand’s Land Based Ecosystems and Their Services

Tools & initiatives

- Capitals Coalition
- ENCORE
- Natural Capital Finance Alliance (NCFA)
- Nature-Based Solutions Initiative (information and case studies)
- Taskforce on Nature-related Financial Disclosures (TNFD)
- Finance for Biodiversity Foundation Overview of Initiatives (17 initiatives featured here)

Other readings

- Little Book of Investing in Nature
- PRI: Investor Action on Biodiversity Discussion Paper
- Financing Nature: Closing the Global Biodiversity Funding Gap, Executive Summary (Paulson Institute)
- Nature Conservancy: Investing In Nature Report

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