NATURAL CAPITAL COALITION

A PART OF THE TEEB COMMUNITY

Valuing nature in business

Valuing natural capital in business

TOWARDS A HARMONISED PROTOCOL

Why should business and investors be interested in natural capital and this project?

For businesses to be viable in the long term the ecosystems and resources they depend on must be maintained, yet when it comes to the natural environment we are seeing a rapid depletion of capital. Economic invisibility has been a major reason for the neglect of natural capital. The current business model creates significant environmental externalities that are not priced eg, damages from climate change, pollution, land conversion and depletion of natural resources. As a result, there is a growing case for understanding the dependencies business has on natural capital, the risks and opportunities associated with this relationship and their real value. Integrating natural capital in business decision making leads to better business decisions with the benefits of greater resilience, improved security of supply and ultimately a sustainable business model. Valuing natural capital specifically can improve business decisions on risk management, supply chain sourcing decisions, new markets/investments, saving costs, sustaining revenues and environmental performance.

One of the challenges at present is the lack of a harmonised framework for how to value natural capital and apply it in business decision making. This is what the Coalition's Natural Capital Protocol project aims to do.

We have an open call for business, investors and wider interested stakeholders to participate and shape the future. By participating business and investors participants can gain an early mover understanding and practical application of natural capital valuation.

Natural Capital Coalition

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Valuing natural capital in business

TOWARDS A HARMONISED PROTOCOL

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Executive summary

Resource scarcity concerns are driving a growing interest from business and investors to understand natural capital impacts, dependencies and their value – both financial and non-financial. Key challenges to business uptake are a lack of market incentives, a standardised framework for what and how to apply natural capital toolkits in mainstream business applications and an increasingly complex array of offerings designed for different purposes.[1,2,3]

To respond to this challenge, the Natural Capital Coalition, with funding from the International Finance Corporation (IFC) and the Gordon and Betty Moore Foundation, are conducting a project to develop and pilot test a harmonised framework for valuing natural capital in business decision making which will enable better measurement, management, reporting and disclosure. The proposed name of the framework is the Natural Capital Protocol.

The rationale for the Natural Capital Protocol is similar in some ways to the GHG Protocol which harmonised GHG emissions measurement many years ago. This Protocol would do the same for natural capital. The intent of the framework is not to invent new methodologies or guides unnecessarily, but to build on the existing front runners, by including technical innovations and filling gaps that can enable scalable integration of natural capital considerations in business.

The Protocol will be generic and applicable to all business sectors. In addition to this, two supporting sector-specific guides for food and apparel will be developed. These will focus on the material impacts and dependencies specific to these sectors. Food and apparel have been chosen to start with as they have high natural capital impacts and early adopter business interest. Additional sector specific guides in high impact sectors eg, energy, forestry, fisheries, mining and construction are planned as future Coalition projects. The pilot testing will enable a period of experimentation in the market via different sectors and geographies to inform the protocol and guides. It is anticipated that the resulting protocol will inform future standards.

As a first step towards developing the Natural Capital Protocol, existing initiatives were reviewed. This informs the specification of the Protocol and in particular the value it can add to what is already in place. Further, a consultation process was used to incorporate expert input from leaders of natural capital initiatives in business, policy, NGOs, academia and consultancy on the Protocol contents.

In *Taking Stock: Valuing natural capital for business: Existing initiatives and applications* the following existing initiatives have been reviewed and are summarised:

- Business engagement initiatives.
- Methodologies, tools and initiatives relevant to measuring, managing and valuing natural capital in business and investor decision making.
- Initiatives relevant to using natural capital valuation in business applications eg, strategy, management (at organisation or supply chain levels), reporting and disclosure.
- Policy initiatives that define natural capital accounting classifications, metrics and indicators that can inform future target setting and new market initiatives relevant to business.

Headline findings from the analysis of the expert input and these existing initiatives include the following:

- A growing number of fragmented natural capital activities are underway in policy, NGO, business, research and consultancy communities. With interest from policy and business communities growing an increasing number of initiatives have been developed to respond to different user needs. This is like a jigsaw with some of the pieces in place but disconnected and gaps needing to be filled.
- Initiatives can appear confusing to business and investors as the business case is not clear. For example, the business case is evolving to include more informed decision making, risk mitigation, securing resource supply, long-term value creation, resilience and profitability. There is also little clarity for the business and investor user on specifically what, why and how natural capital measurement and management can add value in decision making.
- Market push and pull factors are needed to motivate behaviour change to integrate natural capital and transform business models. These can motivate corporate behavior change to preserve rather than degrade natural capital. On the business support side, a key challenge in increasing uptake is the lack of a harmonised framework. This would clarify how natural capital valuation can be practically used in business applications eg, strategic planning, management at site and supply chain levels, financial accounts, corporate reporting and disclosure.
- Another challenge is a lack of incentives – regulatory and market based – to drive business engagement.

Based on the analysis of existing initiatives and feedback from the consultation to date a Natural Capital Protocol that defines harmonised principles on what, why and how business can use natural capital in a range of business applications is required. The Protocol would build on existing methodologies and tools, while aiming to overcome existing gaps and business barriers. Given the different stages users are at and in particular the early stage of business understanding, feedback has proposed the Protocol would be in two parts:

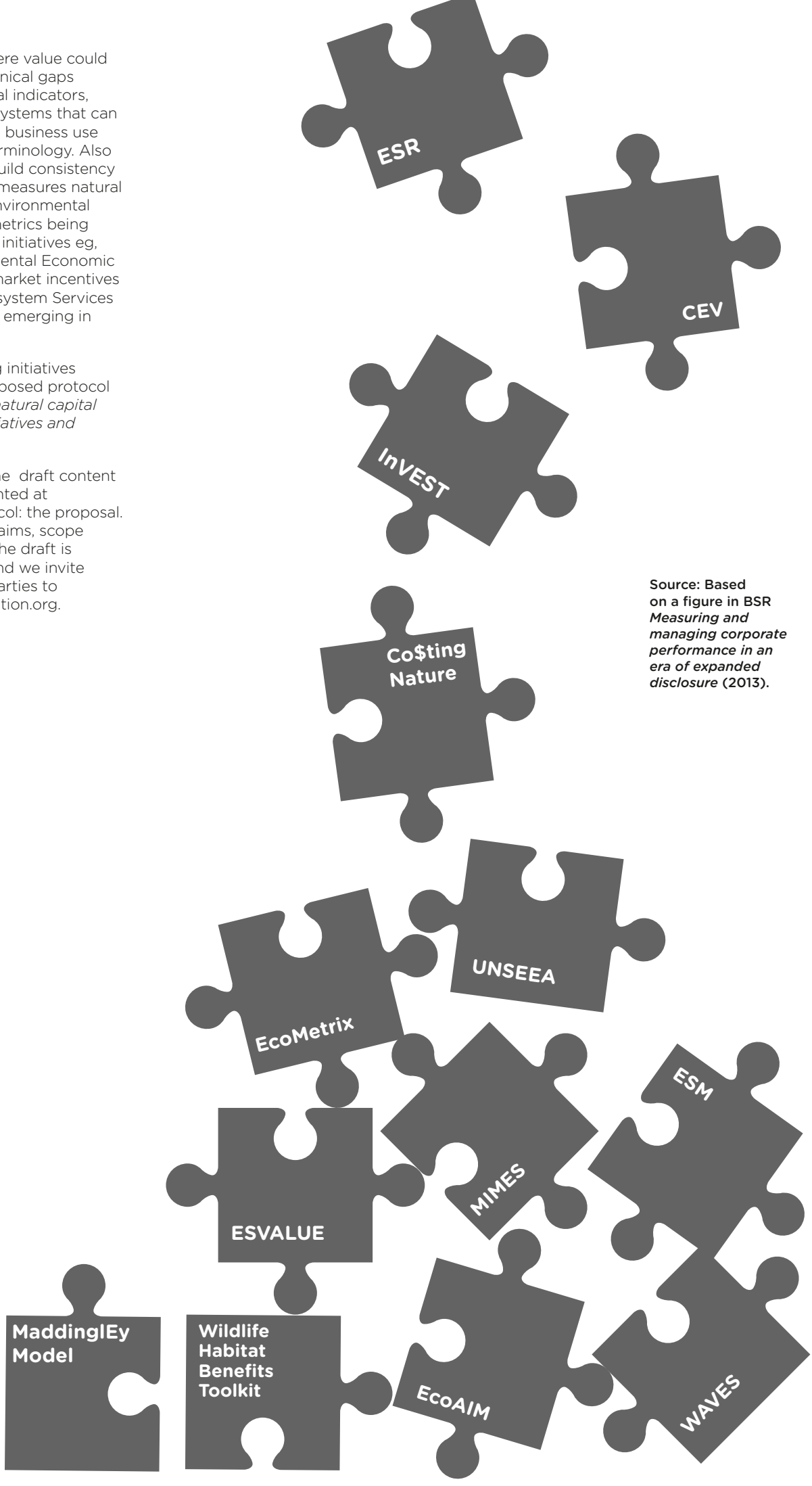
- A high-level guide to natural capital for CXOs, and in particular CFOs, to explain why this matters and what they can do to incorporate it into their business decision making, reporting and disclosure.
- A more detailed framework document aimed at practitioners in business, policy, consulting and research would support the high-level guide.

The framework would incorporate harmonised principles for what should be measured, valued and how. This would include clarity on types of capital (making the connections between 'natural capital' and 'financial, manufactured, societal, human and intellectual capitals), impact and dependency of business on natural capital, business applications of valuation, impacts and indicators, materiality and an accepted nomenclature for classification of natural capital metrics.

Key areas identified where value could be added are to fill technical gaps relating to natural capital indicators, data and classification systems that can facilitate mainstreaming business use as well as simplifying terminology. Also identified is a need to build consistency between how business measures natural capital and emerging environmental economic accounting metrics being developed in key policy initiatives eg, UN System of Environmental Economic Accounts (SEEA) and market incentives eg, Payments from Ecosystem Services (PES) national schemes emerging in several countries.

The mapping of existing initiatives which informed the proposed protocol are outlined in *Valuing natural capital in business: Existing initiatives and applications.*

A strawman outlining the draft content of the Protocol is presented at 4. Natural Capital Protocol: the proposal. This also includes draft aims, scope and design principles. The draft is open for consultation and we invite views from interested parties to info@naturalcapitalcoalition.org.



Source: Based on a figure in BSR *Measuring and managing corporate performance in an era of expanded disclosure* (2013).

1. PROCESS AND CONTRIBUTORS

This publication was compiled based on desktop research and feedback from leaders of natural capital initiatives and developers of the front-runner methodologies and tools. A consultation process was used to incorporate input from a wider group of interested stakeholders from business, policy, NGOs, academia and consultancy to inform the content.

The consultation used a combination of in person workshops and events, webinars, calls and circulating documents for comment. The consultation was designed to inform, get feedback and build consensus on the baseline stock take, gaps, next steps required and a draft specification for the Protocol. Early adopter businesses were strongly encouraged to participate, in particular from business sectors and supply chains with high natural capital impacts eg, agricultural commodities, forestry, fisheries, energy, mining, construction and some consumer goods eg, apparel.

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The following are gratefully acknowledged for participating in the consultation process. The views in this publication do not necessarily represent the views of the contributors.

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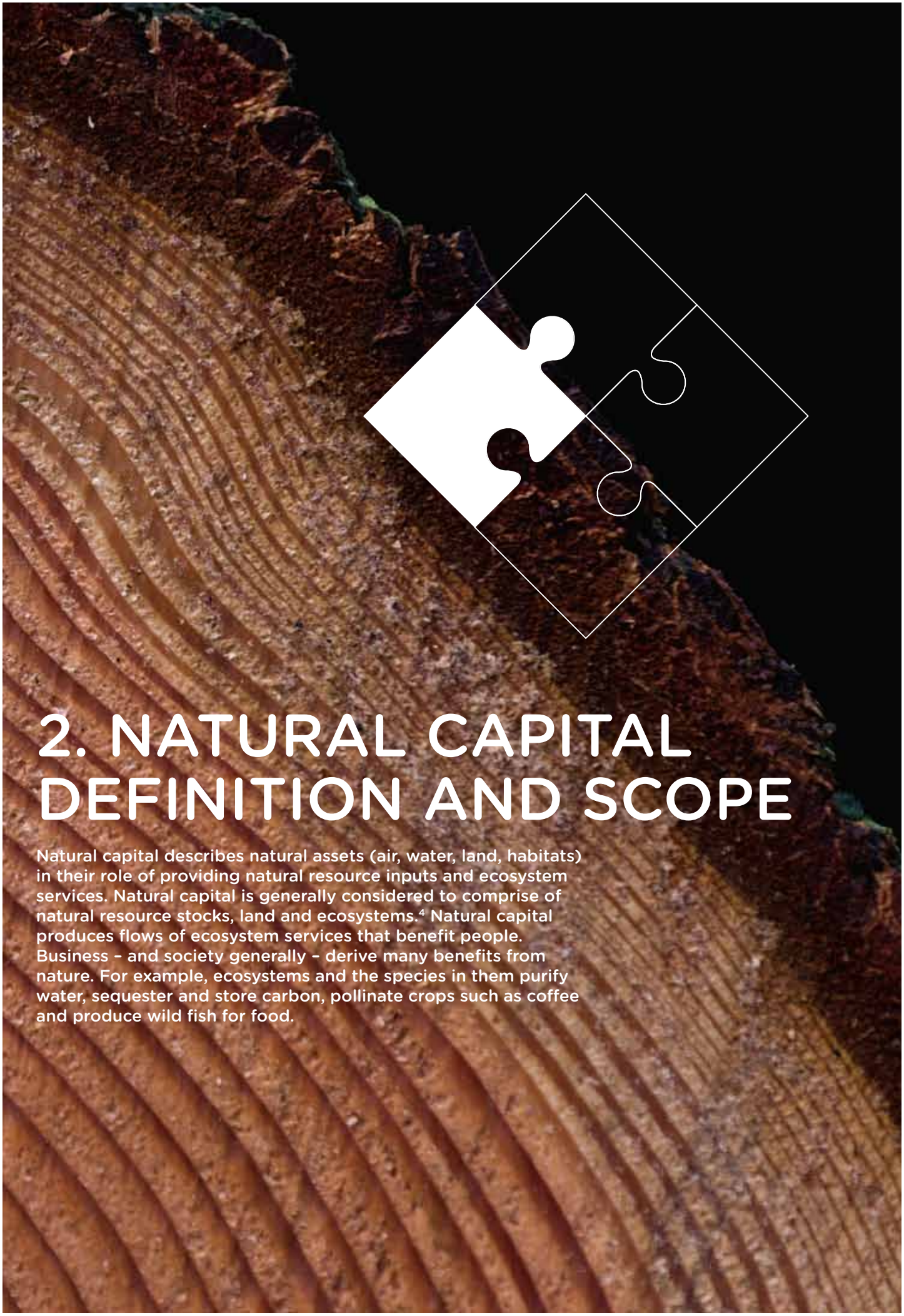


2. NATURAL CAPITAL DEFINITION AND SCOPE

Natural capital describes natural assets (air, water, land, habitats) in their role of providing natural resource inputs and ecosystem services. Natural capital is generally considered to comprise of natural resource stocks, land and ecosystems.[4] Natural capital produces flows of ecosystem services that benefit people. Business – and society generally – derive many benefits from nature. For example, ecosystems and the species in them purify water, sequester and store carbon, pollinate crops such as coffee and produce wild fish for food.

Figure 1: Examples of business risks and opportunities arising from ecosystem services

Type	Risk	Opportunity
Operational	• Increased scarcity or cost of inputs • Reduced output or productivity • Disruption to business operations	• Increased efficiency • Low-impact industrial processes • Supply chain cost savings through resource avoidance or substitution
Regulatory and legal	• Extraction moratoria • Lower quotas • Fines • User fees • Permit or licence suspension • Permit denial • Lawsuits	• Formal licence to expand operations • New products to meet new regulations • Opportunity to shape government policy • Supply chain cost savings through resource avoidance or substitution
Reputational	• Damage to brand or image • Challenge to social 'licence to operate'	• Improved or differentiated brand
Market and product	• Changes in customer preferences (public sector, private sector)	• New products or services • Markets for certified products • Markets for ecosystem services • New revenue streams from company-owned or managed ecosystems
Financing	• Higher cost of capital • More rigorous lending requirements	• Increased investment by progressive lenders and socially responsible investment funds • Increased investor confidence lowers investment barriers, avoids transaction delays and associated fees

Source: Modified from *Corporate Ecosystem Services Review*, reproduced with permission World Resources Institute and World Business Council for Sustainable Development.

Externalities

Many of these ecosystem services are affected by externalities. An externality occurs when an activity incurs costs and benefits affecting others who are not involved in the decision. An example of a negative externality is deforestation caused by plantation expansion, which reduces land-based carbon storage and increases the negative impacts of climate change. This incurs social and physical costs on people globally. These costs are not considered by the plantation owner – unless they are priced, for example in a global carbon market.

The price of ecosystem services are not readily captured in markets, so their contribution to the economy, business models and livelihoods is not well-recognised or incorporated into decisions. This can lead to degradation and under-provision of many ecosystem services.[5] Government action can help 'internalise' externalities eg, taxing actions that create negative externalities, subsidising actions that create positive externalities and creating new markets that reflect the true social value of ecosystem services.

Of the benefits, closely dependent on biodiversity, which human beings obtain from ecosystem services three types are commonly used based on the most recent internationally relevant classification system.[6]

- Provisioning services: the products obtained from ecosystems such as food, medicines and fresh water.
- Regulating services: the benefits obtained from the regulation of ecosystem processes such as pollination, flood control and carbon sequestration.
- Cultural services: the non-material benefits people obtain from ecosystems through spiritual enrichment, cognitive development, recreation and aesthetic experiences.

Business both impacts and depends on natural capital which creates a number of risks and opportunities as illustrated in Figure 1.

This project uses a broad definition of natural capital which encompasses the stock of resources and ecosystem service flows associated with a business due to its activities, products and services. Natural capital valuation involves assessment of the financial and non-financial costs and benefits of ecosystem services that a business uses and has an impact on to determine risks and opportunities. This includes those social/economic costs and benefits which take into account externalities and their distribution.

Some natural capital valuation tools are starting to include the externality costs associated with the environmental impacts a business has eg, health impacts and environmental damage. Environmental impacts are already clearly defined in international standards for measuring environmental impacts which for consistency use the same impact definitions eg, Global Warming Potential, generation of waste, air and water pollution. Understanding how impacts and dependencies conceptually relate to natural capital stocks and ecosystem flows for the purposes of valuation is an important clarification the Natural Capital Protocol can include.

3. STATUS VALUING NATURAL CAPITAL IN BUSINESS

Integration of natural capital considerations in business and their valuation is at a very early stage. There are a growing number of fragmented natural capital initiatives underway in the policy, NGO, business, research and consultancy communities which have been developed to respond to different user needs. This is a reflection of the status of the topic which is like a jigsaw where several pieces are in place but not always connected and there are significant gaps to be filled.

There is activity in the following areas:

- Business engagement – this is at an early stage but with an increasing volume of business hubs to support awareness raising and engagement.
- Natural capital impacts and dependencies assessment – many methodologies and tools are available to support measuring and managing natural capital impacts and dependencies with some designed for business users.
- Valuation – environmental economic valuation techniques are established and there is a small but growing number of guides and tools to support natural capital valuation in business. Economists have been applying various valuation techniques for decades. However, application and consideration of valuation techniques in mainstream financial accounting is only beginning. Some recent innovations are relevant to businesses interested to apply these techniques:
  - the development of valuation tools which aim to make valuation easier, quicker, cheaper and more streamlined;
  - the integration of valuation techniques using Geographic Information Systems, which ensure analyses and results are spatially explicit ie, mapped; and,
  - the application and tailoring of these tools and valuation techniques to business decisions.
- Data – data to support assessment of natural capital impacts and dependencies is available in a range of sources but access for business users is limited. Valuation databases are limited with inconsistent quality. In both cases, the data sources are not connected with the mainstream database tools business use for sustainability managment at present. Natural capital data and business access has many signficant gaps requiring much development.
- Business applications – this can include informing strategic decision making, management of an organisation's and/or supply chain impacts, procurement/sourcing, financial accounting, corporate reporting and disclosure.
- Finance applications – for an investor, valuation information can be used in their Environmental, Social and Governance (ESG) assessment to determine the risks and opportunities a portfolio presents. For an insurer valuation can inform risk assessment.
- Policy – key policy initiatives to include natural capital in national accounting metrics eg, UN System of Environmental Economic Accounts (SEEA), beyond GDP indicators and new market incentives eg, Payments for Ecosytem Services (PES) are emerging. The methodologies and metrics for valuation in business will need to be consistent with the enabling policy frameworks and accounting for natural capital in case future target setting enables progress to be measured.

Looking specifically at valuing natural capital and business applications, Figure 3 (right) illustrates the key steps to assess natural capital impacts and dependencies, value those that are material and apply the information in different decision-making applications. These steps are defined in several existing guides eg, WRI WBCSD Corporate Ecosystem Services Review (ESR) and WBCSD Guide to Corporate Ecosystem Valuation (CEV).

The steps include:

- Defining the scope of business activities to be considered – activities at the organisational eg, site/factory level, across the value/supply chain eg, product level and the landscape level.
- Measuring the ecosystem services that business impacts or depends on, determining those which are most significant or material and the wider societal value they are creating.
- Assessing the value of these ecosystem services, using a range of valuation techniques. Value can be measured in non-monetary – biophysical or social metrics – and monetary terms. Monetary values are often most appropriately interpreted as relative rather than absolute in light of the uncertainties inherent in current valuation techniques. However, by including monetary values, impacts and dependencies are translated into monetary risks and opportunities which are key to engaging business decision makers eg, the CFO.
- Using the valuation information in different business and finance applications to inform decision making.

Figure 2: Mapping existing natural capital initiatives

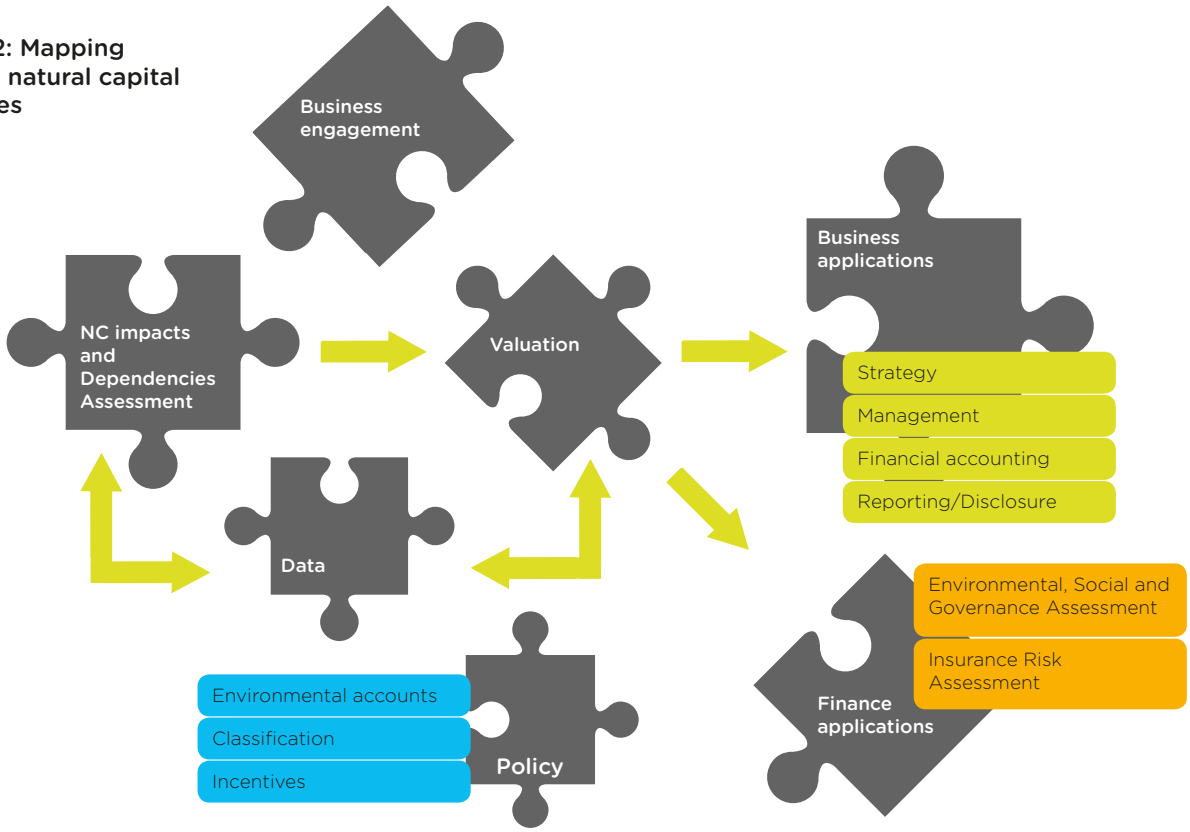
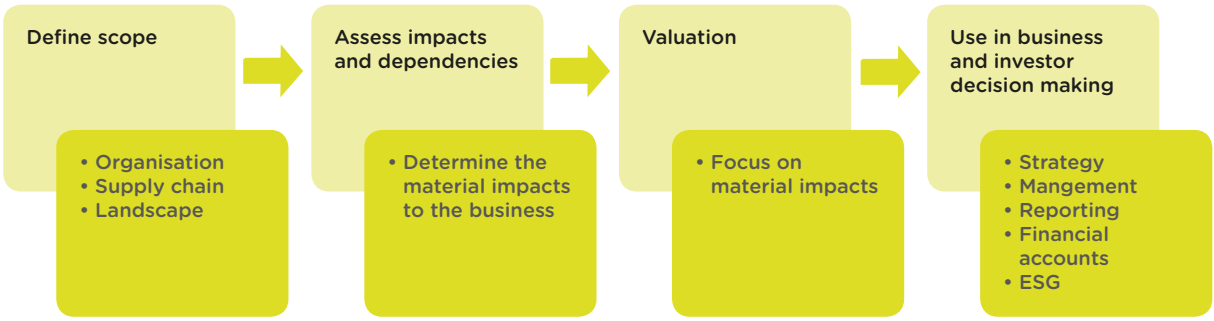


Figure 3: Valuing natural capital and business applications



Businesses already take many of these steps in measuring, managing and reporting on their environmental impacts and to a lesser extent their dependencies on nature. To simplify valuation for business users and to increase uptake, consistency with existing business initiatives, standards and tools will be critical. In the future integration of natural capital valuation into these business-focused standards and tools will facilitate mainstream uptake. Figure 4 shows the status of these applications in terms of development and uptake. Examples of key initiatives include the following:

1. Environmental impacts measurement– Life Cycle Assessment (LCA) (full or simplified approaches) and footprinting international standards and guidance[8] are well developed. They are increasingly used by business to measure their significant environmental impacts to the business. A current gap is that biodiversity and ecosystem services are not included in LCA. There is little connection between the metrics and tools which underpin biodiversity and ecosystem services assessment and environmental impact assessment, although there are some research initiatives aiming to bridge this that can be built on.

   Environmental and Social Impact Assessment (ESIA) and related tools are also well established in business with well developed guidance.

2. Management – environmental management systems, risk management and supply chain management are mainstream approaches business uses for managing its sustainability impacts either at an organisational eg, site/factory level or supply-chain level. For site level, natural capital valuation can inform environmental management and in particular green infrastructure decisions eg, The Dow Chemical Company have used it for waste water treatment. For supply chain management and sourcing decisions in particular, natural capital valuation can be used eg, Kering Group have used it for sports shoe raw material choices. Green procurement to source lower impact raw materials is already used by both the public and private sector with sector/product specific guides available.

3. Reporting and disclosure – initiatives for financial and non-financial reporting and disclosure are well developed. The following are of most relevance for application of natural capital valuation.

   – Corporate reporting – voluntary corporate reporting used for disclosing sustainability performance. eg, Integrated Reporting <IR> and Global Reporting Initiative (GRI).

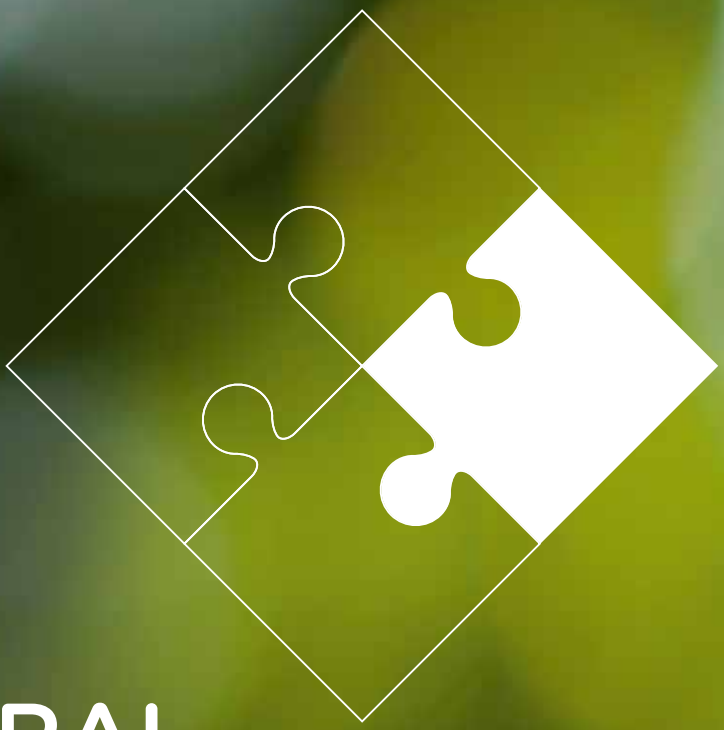
   – Financial accounting and reporting – for management accounting, budgeting and financial reporting as defined by international accounting and financial standards/guidance. In financial/accounting language this focuses on the 'material' items of the business. These are those that would influence the users of the financial accounts eg, shareholders, lenders or investors. Financial reporting is determined by the world's two main accounting systems: US Generally Accepted Accounting Principles (US GAAP) and International Financial Reporting Standards (IFRS) (used in the European Union and many other countries). While risk assessment and disclosure is incorporated in these systems, natural capital specifically is not incorporated but could be in future to integrate this thinking at source.

   – Investor Environmental, Social and Governance (ESG) – for assessing risks and opportunities in investor client portfolios eg, a range of socially responsible investment initiatives, guidance and ratings systems. An existing leader example is the IFC Performance Standard 6 which requires ecosystem services and biodiversity to be considered in risk assessment. Other examples providing ESG guidance include from the Sustainable Accounting Standards Board (SASB), Equator Principles and UN Principles for Responsible Investment (UNPRI).

For further background see *Taking Stock: Existing initiatives and applications*.

	Impact and depencies Measurement		Management	Financial A/Cs	Reporting and disclosure	ESG assessment
Approaches	Environmental impast	Ecosystem services and biodiversity	Organisation supply chain landscape	Statutory reporting	Corporate sustainability	
Existing standards and guidance (examples)	LCA & Footprint Stds EISA	Growing	EMS Risk Assessment Green SCM and procurement	US GAAP/ IFRS	GRI, <IR> CDP, CDSB	IFC Perf 6, SASB, Equator, UNPRI
Data and tools	Developed	Growing	Developed	Developed	Developed	Growing
Inclusion of natural capital valuation	NO	NO	NO	NO	NO	NO
Business uptake	MEDIUM	LOW	MEDIUM	HIGH	MEDIUM	LIMITED

Figure 4: Status of business applications for natural capital valuation



4. NATURAL CAPITAL PROTOCOL: THE PROPOSAL

The Natural Capital Protocol proposal is based on views gathered from the stock take and consultation exercises conducted to date. It includes draft aims and format, scope, design principles and outline content proposed with rationale. This proposal is a strawman only and provides an initial starting point for the protocol development.

The proposed aims, format options, scope and design criteria are outlined below.

Aims and format

Users have different stages of knowledge, experience and business understanding. Therefore, consideration should be given to producing the protocol in two parts:

- A high-level guide outlining the what, why and how for the business user focusing on the CXO specifically.
- A more detailed framework aimed at practitioners in business, policy, consulting and research supporting the high-level guide. This would incorporate harmonised principles for what should be measured, valued and how.

The high-level guide and framework will be available in the public domain to maximise uptake.

Scope of the Protocol

While natural capital is the key focus, links with the five other types of capital (financial, manufactured, societal and relationship, intellectual and human), in particular social and human, should be incorporated. It is recognised that social impact-related valuation techniques are at a much earlier stage than those for environment.

The intent is for the Protocol to focus on both business and financial institutions, understanding that while their applications for natural capital valuation are different the underlying principles need to be consistent. Natural Capital Coalition is collaborating directly with the Natural Capital Declaration (NCD) Work Groups which are developing methodologies specifically for finance institution applications. This collaboration avoids duplication as well as ensuring consistency. In particular a finance sector guide is planned by NCD WG3 that would be developed in collaboration with the Coalition.

Format and design criteria

- Pragmatic, useable, accessible.
- Integrating methodologies and metrics that are already available where they are fit for purpose.
- Business language and consistency with mainstream approaches and terminology business already use.
- The focus should be on business applications of natural capital valuation and how this provides sustainability solutions for a company.
- Different end users need to be catered for with the different parts of the Protocol. These include (1) practitioners on technical content (2) business and (3) financial institution users for business case and application. The format, language, technical detail and aim of each deliverable should be in line with the users' requirements.

This high-level guide is for CXO level, in particular CFOs, CEOs, COOs and heads of sustainability, operations and procurement. The aim of the guide is to succinctly explain the business benefits from managing, accounting and valuing natural capital, with tangible examples of quantified benefits.

Outline content

The proposed outline content includes:

Business case
- What and why does it matter
- Where it fits in the toolkit

Big picture
- Natural capital links with five other types of capital and related business models focusing on value creation, net positive and integrated thinking/reporting
- Incentives required – regulatory and market e.g. Payments for Ecosystem Services, Water Funds

Applying natural capital valuation in business
- High-level Route map
- Using key questions/uses business are likely to have in practice
- Examples to illustrate applications

The key considerations in each section proposed are outlined below.

Business case for the user
- Describe why it's important to measure, value and account for natural capital.
- Describe the business case to include risk mitigation, securing resource supply, supply chain traceability, reputation benefit, long-term value creation, resilience and profitability.
- Specify what the added value to business is expressed in terms of more informed decision making on risks and opportunities as well as assets and liabilities.
- Use the language of business and financial institutions (bearing in mind each of these is different) and supporting examples relevant to these communities. For example, how valuation informs return on investment (ROI), price volatility etc. Include positive examples to encourage business to see the benefits eg, Unilever saving $300m avoided costs due to analysing natural resource risk and associated price volatility.
- Describe the applications for natural capital valuation in business decision making and the solutions it provides for business beyond existing sustainable business tools.
- Clarify that the business case levers vary around the world based on local priorities eg, water scarcity in Australia.

Big picture – sustainable business models and value creation
- Make the connections between 'natural capital' and the five other capitals – 'financial, manufactured, societal and relationship, intellectual and human.'
- Make the connections with bigger picture concepts eg, integrated thinking/ reporting, long-term value creation and social license to operate.
- Highlight that because natural capital is at an early stage in business use, there is an early mover opportunity for the private sector to increase ownership and influence decisions made at the public sector level on the natural capital and wider agenda.
- As the wider enabling policy and market conditions to incentivise corporate uptake of natural capital are minimal at present, inclusion of key incentives required has been suggested. It is recognised that content on incentives would not normally be included in 'protocols' or standards, however, feedback has been significant that this is important given the early stage of natural capital in business. This would highlight what the most promising incentives are and provide the business perspective on how governments and other stakeholders can act to provide them. Current examples of promising incentives that have been suggested for inclusion include Water Funds to support watershed protection and Payments for Ecosystem Services to create markets.

Applying natural capital valuation in business
- Use a route map format to illustrate the key applications of strategy, management, reporting and disclosure. This route map should show the different methodologies, techniques and tools that can support different decision-making applications.at the high level. This approach will overcome misunderstandings that current methodologies can be universally applied.
- Use key questions that businesses are likely to have to clarify the business applications eg:
  - What are the natural capital and ecosystem services in the places that I operate?
  - Which ones do I depend upon and which do I impact?
  - How does it affect my business, local and global stakeholders?
  - What operational risk is posed to my business by the impact of environmental change eg, availability, quality, price of natural capital inputs?
  - What operational risk is posed to my business by the impact of other stakeholders?
  - What new market opportunities to these bring to my business?
  - What are the relevant scenarios for change and their impact on natural capital and ecosystem services at my sites of operation/through my supply chain?
  - What reputational risk is posed by the impact of my business on natural capital and ecosystem services?
  - Who else relies on the benefits from natural capital at my sites of operation?
  - How do I map/value these risks to my business and what is the role of economic valuation in that?
- Use examples to illustrate natural capital valuation applications – real business examples where available or anonymous.

The users for this framework are practitioners in business, policy, consulting and research.

Outline content

The proposed outline content includes:

Definitions and scope

Identifying and measuring natural capital impacts and dependencies
- Classification and indicators
- Materiality

Valuing Natural Capital in Business Applications
- Which technique and tool(s) for which application and how – fitness for purpose
- Clarity on inputs required and outputs expected
- Clarity on benefits, limitations, trade offs
- Clarity on uncertainty of valuations – relative versus absolute
- Illustrate with examples (anonymized or real)

Data, tools and databases
- Filling gaps and access
- Criteria and quality norms required for consistency
- Standalone/adding to LCA databases and tools
- Using technology innovations in monitoring

Verification and assurance

The key considerations in each section proposed are outlined below. Further detail on the examples given can be found in *Taking stock: Existing initiatives and applications*.

Definitions
- Ensure clarity and consistency on terms but framed using existing business language rather than creating new terms or using complex jargon.

Scope and boundary setting
- Define the different business applications of natural capital based on the scope required eg, hotspot/ high-level diagnosis, organisation/site, product supply chain, landscape.

Identifying and measuring natural capital impacts and dependencies
- Build on the route map in the high-level guide to provide a detailed 'how to' for measuring natural capital impacts and dependencies. This will build on the tools and techniques already in place but clarify how and which to use for different business applications, key gaps and limitations.
- Define the classification systems and indicators to be used. Use the key environmental impact indicators business already use and fill in the gaps for ecosystem services and biodiversity.
- The UN Central Product Classification (CPC) for product groups is normally used to define product groups/categories for environmental impact assessment in Life Cycle Assessment (LCA), carbon and water footprinting. Other consistent classifications such as the Global Product Classification (GPC) taxonomy and GS1 (consistent with trade categories) are worth consideration as they are being used by some international initiatives for example, The Sustainability Consortium.
- Include technical developments underway in existing methodologies and tools that can facilitate uptake.
- For classification systems, build in consistency with existing industry approaches as well as evolving environmental economic accounting systems so far only being used in policy applications. These have potential application in corporate accounting which could fast track widespread uptake. Examples include:
  - UNSEEA System of Environmental Economic Accounts (SEEA) and the supporting World Bank Wealth Accounting and Valuation of Ecosystem Services (WAVES) for measuring stocks and flows/mass balance.
  - Developing systems for defining, classifying, and measuring ecosystem services. Key examples are the Common International Classification of Ecosystem Services (CICES) informing the land and ecosystems content in the UN SEEA15 and the US Environmental Protection Agency (EPA) led Final Ecosystem Goods and Services Classification System (FEGS-CS) for identifying Final Ecosystem Services (FEGS).[10] The National Ecosystem Services Classification System (NESCS) is in development by EPA which combines the FEGS-CS with economic production functions in order to define, quantify and value FEGS. These define standardised approaches for defining and classifying ecosystem services so they can be measured, quantified, and valued in a reliable and consistent way for policy and business applications.

- Gaps to mainstream uptake are indicators for biodiversity, land use and ecosystem services in LCA and footprinting standards. Tools such as Eco LCA[14] aim to combine LCA indicators with ecosystem services. Trial LCA indicators are also in development by UNEP/SETAC and others[15,16] to fill current gaps but need testing in the market. For example, the UNEP/SETAC Land Use Life Cycle Impact Assessment (LULCIA) project[17] establishes preliminary methods for incorporating land use impacts on biodiversity and ecosystem services, two recognised indicators of ecosystem quality into LCA. Further, impact indicators have been proposed for the three ecosystem services identified by the Millennium Ecosystem Assessment as most impacted by anthropogenic interventions – Erosion Regulation Potential (ERP), Freshwater Regulation Potential (FWRP), and Water Purification Potential (WPP).[18] For each category, an impact indicator is suggested: erosion resistance for ERP, groundwater recharge for FWRP, and physiochemical filtration and mechanical filtration for WPP. These impact categories and indicators are shown in Figure 5 below. Other areas suitable for future indicators include carbon sequestration and nutrient retention.
- There is also a need to quantify the demand and supply of ecosystem services at various spatial scales. LCA only focuses on the supply chain so does not include this. Other spatial scales eg, at the landscape level, are needed for ecosystem services to inform the right mitigation decisions and solutions. A combination of landscape tools and LCA could provide this and has been used in a small number of business applications.

Determining and redefining materiality

- Clarify what is material, or significant, for the owners of the capital being impacted. This includes the business, its shareholders, society and specifically the impacted stakeholder groups at the local level.
- Clarify what material impacts should be measured for high-impact sectors and what data are required. This will link to the two sector-specific guides on food and apparel being developed which will focus only on material impacts to those sectors for some simplification.
- Include examples to illustrate key resource constraints eg, water scarcity, using different geographies that are priority risk areas.

Valuing natural capital in business applications

Having measured the natural capital impacts and dependencies, this section clarifies how to value, account for and apply this information in different business applications.

- The following applications of natural capital valuation should be included:
  - Strategy development
  - Management
    - (i) Organisation/site level
    - (ii) Green or natural infrastructure
    - (iii) Supply chain – management, sourcing and procurement
  - Corporate reporting eg, in GRI and <IR>
  - Management accounting, budgets and project finance
  - Financial accounting and reporting eg, P&L and Balance Sheet
  - Mergers and acquisitions
  - Market opportunities eg, Payments for Ecosystem Services (PES)

Figure 5: Trial LCA impact indicators for the Ecosystem Services Erosion Regulation Potential (ERP), Freshwater Regulation Potential (FWRP), and Water Purification Potential (WPP)

Impact category	Erosion Regulation Potential (ERP)	Freshwater Regulation Potential (FWRP)	Water Purification Potential (WPP)	
	Ecosystem ability to resist erosion	Shows the soil's capacity to regulate peak water flows	Soil's ability to absorb dissolved soil particles (physiochemical) and clean the water entering the groundwater supply (mechanical)	
Indicator	**Erosion resistance**	**Groundwater recharge**	**Physiochemical filtration**	**Mechanical filtration**
	Measured in (tons of soil eroded/(ha*yr)	Millimeters of water recharged into the water table per year	Centimoles of cation fixed/kg soil	Rate of H_20 passing through soil (cm/day)

Source: Saad et al, 2003.

- Clarify the following when describing the 'how to':
  - Which valuation techniques to apply, how and in what circumstances based on fitness for the purpose. For example, using WBCSD Corporate Ecosystem Valuation and Business Guide to Water Valuation as a starting point, provide more detail on which valuation technique to use and when to include the following:
    (i) The input requirements and outputs expected for different applications.
    (ii) Define good/best practice.
    (iii) Benefits, limitations of current approaches and trade-offs
    (iv) Clarify pros and cons of difference techniques eg, benefit transfer can be more cost and time effective than primary valuation, but presents significant data and reliability challenges
    (v) Clarify the uncertainty inherent in valuation estimates and that these are not for absolute, but relative use. This is needed to clarify the fitness for purpose for different applications which is currently misunderstood by business
    (vi) Clarify how to avoid double counting.
- Show how to link valuation with related financial techniques eg, net present value, cost benefit analysis and no net loss.
- Show how to use valuation in different applications with real or anonymous worked case examples. This can clarify which valuation techniques, methods and tools are suitable for different applications. For example, pick an issue that frequently comes up from business such as water scarcity and show the data requirements, tools and steps to conduct the valuation.
- Include the types of values which can be used and in what circumstances eg, 'damage costs' as distinct from 'willingness to pay'.
- Include 'fair share' thresholds to give an indication of valuation ranges where available and guidance on which to use for different ecosystem services, contexts and geographies.

Valuing natural capital in financial institution applications

- This section clarifies how to use natural capital valuation in investor environmental, social and governance assessments (ESG). The Natural Capital Declaration is commencing development of methodologies for incorporating natural capital in investor applications. This is specifically the focus of Work Group 3 chaired by National Australia Bank. The intent is that this would provide a consistent framework for investors to start educating themselves, build information into risk models and start asking corporations questions about the materiality and use of natural capital. The Coalition and NCD are working closely together to avoid duplication of efforts in this section of the protocol. Depending on the progress of the NCD Work Group 3, this section may cross reference directly to the NCD developed guidance.

Data, tools and databases

- To simplify use of valuation in business via software tools, valuation could be built into LCA, footprinting or full cost accounting software.
- Clarify the role of current tools and the applications they are suited for. For example, Environmentally Extended Input Out modelling and for geographic factors single regional IO models versus multi-regional IO models.
- There are existing valuation databases eg, Ecosystem Service Valuation Database (ESVD), Environmental Valuation Reference Inventory (EVRI) and Earth Economics: Ecosystem Valuation Toolkit (EVT). However, there are many challenges including significant data gaps, growing availability in particular at local levels, inconsistent quality/credibility/robustness at present and facilitating business access to the data.
- The protocol can define consistent classifications, criteria and quality norms for valuation data and databases.
- One option to facilitate business use of natural capital impacts/dependencies and valuation data is to add it to LCA tools and databases. LCA tools are well established with over 80 available on the market and sector-specific databases with environmental impacts data. Good candidates include LCA tools eg, SimaPro with well-populated databases covering a range of sectors eg, EcoInvent[19] and GABI.[20]
- Technology innovations in monitoring and data access provide opportunities to leap frog current data access limitations. For example, in addition to existing databases, some initiatives are facilitating data access opportunities for natural capital assessments, such as the Group on Earth Observations (GEO), System of Systems and Biodiversity Observation Network (GEOSS and Geo BON), Microsoft .g. General Ecosystems Model (GEM), Madeley Model, and the NASA and European Environment Agency supported Eye on Earth.

Verification and assurance

- This will clarify the likely requirements for third-party verification and assurance of natural capital valuation in the business applications covered by the Protocol.

Notes

[1] ACCA, KPMG and Flora and Fauna International, 2012, 'Is natural capital a material issue? An evaluation of the relevance of biodiversity and ecosystem services to accountancy professionals and the private sector'.

[2] Innovastat (2013) *Organisational Change for Natural Capital Management*.

[3] Defra UK (2013) *Realising Nature's Value: Ecosystem Markets Task Force Final Report*, March 2013.

[4] IIRC, Integrated Reporting Framework, 2013.

[7] Millennium Ecosystem Assessment (2005). *Ecosystems and Human Wellbeing: Synthesis*, Island Press, Washington, DC. www.maweb.org.

[6] The Common International Classification of Ecosystem Services (CICES) which is informing the UN System of Environmental Economic Accounts – http://cices.eu/ has evolved the ecosystem service definitions beyond the Millennium Ecosystem Assessment to better suit economic accounting.

[7] Examples are ISO 14040/44 Life cycle assessment (LCA) standards; Carbon Disclosure Project (CDP), EU Product Environmental Footprint (PEF) Guide; ISO 14067 Carbon footprint; ISO14064 Water Footprint standards.

[8] ISO 14040/44 Life cycle assessment (LCA) standards; *EU Product Environmental Footprint (PEF) Guide; EU Organisational Environmental Footprint (OEF) Guide*, ISO 14067 Carbon footprint & ISO14064 Water Footprint standards, Carbon Disclosure Project (CDP) (GHG emissions, water and forests), WRI/ WBCSD GHG product supply chain standard (GHG emissions).

[9] The Nature Conservancy Dow Collaboration, 2012 Progress Report, www.dow.com/sustainability/change/nature_conserv.htm.

[10] Common International Classification of Ecosystem Services (CICES), Consultation on Version 4, August–December 2012 http://cices.eu/

[11] Landers, DH and Nahlik AM (2013) Final Ecosystem Goods and Services Classification System (FEGS-CS), EPA/600/R-13/ORD-004914, U.S. Environmental Protection Agency, Office of Research and Development, Washington, D.C.

[12] Boyd, J., Banzhaf, S. (2007) 'What are ecosystem services? The need for standardized environmental accounting units'. *Ecological Economics* 63: 616-626.

[13] Ringold PL, Nahlik AM, Boyd JW, and Bernard D. (2011) 'Report from the Workshop on Indicators of Final Ecosystem Goods and Services for Wetlands and Estuaries', EPA/600/X-11/014, US Environmental Protection Agency, 78pp.

[14] The Centre for Resilience, Ohio State University Ecologically Based Life Cycle Assessment is an online accounting system software that quantifies the direct and indirect role of various natural resources for supporting various economic activities.

[15] Product Sustainability Forum, biodiversity indicators project in development (2014).

[16] Fraunhofer, Ecobalance, Proposal for a unified biodiversity impact assessment method, November 2012.

[17] Koellner, T., de Baan, L., Beck, T., Brandão, M., Civit, B., Margni, M., Milà i Canals, L., Saad, R., de Souza, DM., Müller-Wenk, R. (2013) 'UNEP- SETAC guideline on global land use impacts on biodiversity and ecosystem services in LCA', *The International Journal of Life Cycle Assessment*. DOI: 10.1007/s11367-013-0579-z.

[18] Saad, R., Koellner, T., Margni, M. (2013) 'Land use impacts on freshwater regulation, erosion regulation and water purification: a spatial approach for a global scale', *The International Journal of Life Cycle Assessment*. DOI: 10.1007/s11367-013-0577-1.

[19] LCA database consistent with main LCA software tools and including several thousands of Life Cycle Inventory datasets covering agriculture, energy supply, transport, biofuels and biomaterials, bulk and specialty chemicals, construction materials, packaging materials, basic and precious metals, metals processing, ICT and electronics as well as waste treatment.

[20] LCA software and databases from PE International including over 5000 Life Cycle Inventory datasets based on primary data collection covering agriculture, building and construction, chemicals and materials, consumer goods, education, electronics and ICT, energy and utilities, food and beverage and mining, plastics, retail, service sector, textiles.

[21] IIRC (2013) Integrated Reporting Framework.

[22] UNEP (2010) *Guidance manual for the valuation of regulating services*, ISBN: 978-92-807-3131-6.

[23] Millennium Ecosystem Assessment: Ecosystems and Human Well-Being, piii.

[24] http://cices.eu/

Glossary

Biodiversity
The variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems (Convention on Biological Diversity).

Capital
A stock that possesses the capacity of giving rise to flows of goods and/or services. Capital stock is disaggregated into different types of capital: financial, manufactured, intellectual, human, social/organisational and natural (also called ecological or environmental) capital. Each of these stocks produces a flow of 'services', which serve as inputs into the productive process. (Integrated Reporting Framework).[21]

Ecosystem
A dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit (Convention on Biological Diversity).

Ecosystem services or Ecosystem goods and services
Ecosystem services are the direct and indirect contributions of ecosystems to human well-being. (UNEP Guidance Manual for the Valuation of Regulating Services.[22]) Under one classification approach, these include provisioning services such as food and water; regulating services such as flood and disease control; cultural services such as spiritual, recreational, and cultural benefits; and supporting services such as nutrient cycling that maintain the conditions for life on Earth (Millennium Ecosystems Assessment, 2005).[23] However, the appropriate classification system for valuation purposes is still evolving as the understanding of the links the between ecological process-service-human benefit chain increases. Key classification initiatives in development include the Common International Classification of Ecosystem Services (CICES) and Final Ecosystem Goods and Services[24] (FEGS). These are providing greater standardisation for defining, classifying, and measuring ecosystem services and increasing their relevance for economic accounting.

Externalities
A consequence of an action that affects someone other than the company undertaking that action, and for which the company is neither compensated nor penalised through the markets. Externalities can be either positive or negative.

Final ecosystem services or ecosystem goods and services
The contributions that ecosystems make to human well-being. These services are final in that they are the outputs of ecosystems (whether natural, semi-natural or highly modified) that most directly affect the well-being of people. A fundamental characteristic is that they retain a connection to the underlying ecosystem functions, processes and structures that generate them (Common International Classification of Ecosystem Services (CICES).

Materiality
In financial reporting and auditing, an item (usually economic in nature) is material if its omission or misstatement could influence the users of the financial accounts, with 'users' frequently defined as shareholders, investors and lenders.

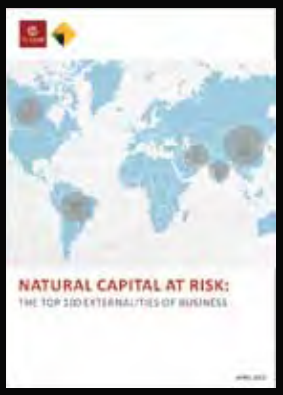
Natural capital
The finite stock of natural assets (air, water, land, habitats) from which goods and services flow to benefit society and the economy. It is made up of ecosystems (providing renewable resources and services), and non-renewable deposits of fossil fuels and minerals.

Value
The value to people from environmental goods and services. Where no market price exists, it can be estimated in monetary terms by using valuation methodologies (UNEP Guidance Manual for the Valuation of Regulating Services). The definition of value can vary with the application/topic and this can cause confusion. For example, to a company, the value of an input (such as an ecosystem service) could be its contribution to profitability. From an accounting perspective, the value of an input or output is its price or cost. From a social benefit cost perspective, the definition of total value is the maximum amount that people would be willing to pay for a good or service. The cost or price is how much they have to pay.

Valuation methodologies
Valuation methodologies define the process of expressing a value for a particular good or service in a certain context (eg, of decision making) usually in terms of something that can be counted, often money, but also through methods and measures from other disciplines (sociology, ecology, and so on). (UNEP Guidance Manual for the Valuation of Regulating Services.)

WHAT NEXT?

Get involved in shaping the financial accounting of the future. For more information and to sign up to participate in the Natural Capital Protocol project visit www.naturalcapitalcoalition.org



Other Coalition publications

Organisational Change for Natural Capital Management – Based on data collected from 26 early adopter companies (60% of them with $10bn+ revenues each) across several industry sectors this provides real life evidence on the drivers and barriers for natural capital management.

Natural Capital at Risk – Top 100 Externalities of Business – This identifies the priority business sectors and world regions with the highest environmental externality costs in order to clarify the financial risk and opportunity this presents to business and investors.

About Natural Capital Coalition

The Natural Capital Coalition is a multi-stakeholder, not for profit platform to build the business case and support the uptake of natural capital valuation, management and disclosure in business and investor decision making. Established in November 2012 as TEEB for Business Coalition we rebranded in January 2014 to Natural Capital Coalition.

Our founder members are pioneers on natural capital and make up our board and advisory groups. New business and stakeholder members are joining on an ongoing basis.

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