Making Nature Count

2016 Conference Report

IRISH FORUM ON NATURAL CAPITAL

Mark Gough
@Mark_Gough
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"Natural capital is about holding capitalism to account"@TonyJuniper @NatCap_Irl #MakeNatureCount

RETWEETS 16 LIKES 14

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Very informative conference by the Irish Forum on Natural Capital today @NatCap_Irl #MakeNatureCount

LIKES 4

Dara Stanley
@DaraStanley
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A huge thanks to @NatCap_Irl for an inspiring day. It seems everyone agrees we need to #MakeNatureCount @JaneCStout @theRiverField

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Standing room only at #makenaturecount! @NatCap_Irl @EPAResearchNews

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Up early to go to @NatCap_Irl annual conference, #MakeNatureCount. Beautiful day to talk about #NaturalCapital

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Pat Costello: "I've been to a lot of conferences, what I've never experienced....is the enthusiasm of people in the room" #MakeNatureCount

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Very interesting discussion on using economics as a tool to #MakeNatureCount. Thought provoking, thanks @NatCap_Irl

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Will Evison
@Will_Evison
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Buzzing atmosphere at #MakeNatureCount this morning, and fantastic sold out venue to talk about #naturalcapital

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Jane Stout
@JaneCStout
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Amazing day @NatCap_Irl conference #makenaturecount - many thanks to all speakers, @NCH_Music, delegates, helpers & esp @theRiverField

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Dara Carroll
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Compelling talk by Dieter Helm at #MakeNatureCount @NatCap_Irl Natural capital is part of the economy, not a luxury.

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Check out our stand at the @NatCap_Irl #MakeNatureCount event today!

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Aideen O'Dochartaigh
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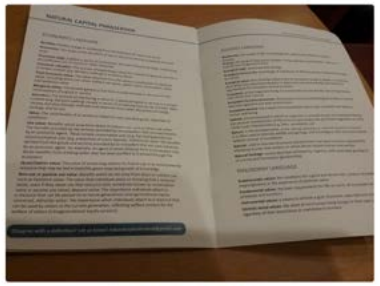
The excellent Natural Capital Phrasebook thanks to @NatCap_Irl #makenaturecount



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@PaddyWoodworth leading a Vaue of Nature walk through Iveagh Gardens, also providing a chance for some fresh air. #MakeNatureCount

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Inspiring talk from @TonyJuniper at @NatCap_Irl #makenaturecount

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Ali Sheridan
@AliJSheridan
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Amazing passion and energy coming from the @NatCap_Irl conference tweets! Let's get to work and #makenaturecount

RETWEETS 2 LIKES 8

ACKNOWLEDGEMENTS

Thank you to our funders:

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Editorial:

This report was edited and designed by Hannah Hamilton, Irish Forum on Natural Capital Secretariat.

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INTRODUCTION

On 4th October 2016 at the National Concert Hall in Dublin, the Irish Forum on Natural Capital (IFNC) held its second public conference on the economics of nature, 'Making Nature Count'. This sold-out event was attended by over 150 delegates and featured 25 speakers from a range of disciplines.

The term natural capital and its associated concepts of stocks and flows have seen businesses, economists, accountants and statisticians working with ecologists, social scientists and environmentalists to apply a new lens to the valuable services that nature provides to humankind for free. Its rapid uptake in both policy and the private sector demonstrates how effective this framing has been in garnering support for nature and improving understanding of its value among sectors that are not traditionally associated with environmental protection, conservation and restoration.

These ideas are still young, however, and the whats, wheres, hows and whys of their use - the science that must inform them, the political economy in which they will be applied, the frameworks and policies that will dictate best practice and the public engagement that will be needed to prioritise action - remain open for discussion.

Like all EU member states, Ireland is committed to accounting for its natural capital by 2020 and while we have made some progress, other countries are further along: Scotland has integrated natural capital in its National Economic Strategy and made increased natural capital an indicator of national performance. Northern Ireland has included the development of a Natural Capital Asset Index in its new Programme for Government. The UK's Natural Capital Committee was the first such group in the world, reporting directly to the cabinet's economic sub-committee and producing multiple reports.

The last year has seen great traction for natural capital assessment in the private sector through the Natural Capital Coalition and its recently-launched Protocol. In Ireland, Bord na Mona became the first company to publicly commit to accounting for its natural capital. In the coming year, we hope that other organisations will follow suit and begin the process of accounting for their impacts and dependencies on nature.

There is significant momentum here and, given the scale of the societal and economic challenges we face from environmental mismanagement, I am excited to be a part of the IFNC and to help to shape what has the potential to be a transformative new agenda for environmental sustainability. If you'd like to get involved, visit www.naturalcapitalireland.com and register as a member.

Professor Jane Stout - Chairperson, Irish Forum on Natural Capital

OPENING SESSION

The conference's opening session gave a general overview of natural capital from a range of perspectives, including ecology, policy and economics. On the following pages, you can read short synopses of the talks, view the slides and watch the videos. Click on the photos below to jump straight to the relevant page.

Tony Juniper is a campaigner, writer, sustainability adviser and a well-known British environmentalist. His talk was titled 'What nature does for us, and how we can keep it doing it'

Gary Gillespie is the Chief Economic Adviser to the Scottish Government and his work has been instrumental in bringing natural capital into policy. His talk was titled 'Natural Capital - why it matters'

Kathy Willis is Director of Science at Kew, Professor of Biodiversity at Oxford and a member of the UK's Natural Capital Committee. Her talk was titled 'Natural Capital Assets: What, where and how many?'

Dieter Helm is a Professor at the University of Oxford and the Chair of the UK's Natural Capital Committee. His talk was titled 'Natural Capital - the opportunities for Ireland'

GLOSSARY

Natural Capital
The world's stocks of natural resources, including air, water, minerals, soils, fossil fuels and all living things

Ecosystem Services
The outputs from ecosystems which have a benefit and value to human wellbeing

Value
The importance, worth or usefulness of something

Valuation
The process of expressing a value for a good or service in a certain context, usually in terms of something that can be counted. Often money (see *Economic Valuation*), but also through methods/measures from other disciplines (sociology, ecology, etc.)

Economics
The study of the allocation of scarce resources among competing desirable ends

Total Economic Value
The value obtained from the various constituents of utilitarian value, including direct use value (food, recreation), indirect use value (flood control), non-use value (the knowledge that nature exists and can be enjoyed by others)

"By revealing the full value of nature, you start to hold capitalism to account"

- Tony Juniper, Author and Campaigner

Why is it so difficult to make progress on a straightforward proposition, that we need to reduce our impact on the systems that sustain us? We've made a moral case and a scientific case, yet they don't seem to have been sufficient to turn the tide of rising human demand upon a diminishing resource-base and evermore stressed ecosystems.

Why? I think it's a failure of economics. We've fallen into the trap of seeing the liquidation of the natural environment as the price of progress - a consequence of what we have to do to grow the economy, achieve competitiveness and end poverty. But what we've done is assume we're taking a flow of benefits when in fact we're liquidating the stocks - the oceans, wetlands, forests, biodiversity. It's a really important conceptual twist.

Click here to watch on YouTube

The the scientific, aesthetic, spiritual, moral and economic arguments for conservation need to be put before the world simultaneously. If we can do this, I think we can begin to transform outcomes by transforming behaviour. This is all about doing things differently.

For example: In Northern Ireland, Dungonnell Water Treatment works had realised that an important ecosystem service was being provided by the capital asset of the local blanket bog. The company decided to invest and restore: they blocked drains, reduced grazing, prevented burning, and as a result, they saw water quality improve, along with habitat quality and better carbon sequestration. Restoring the bog was cheaper than the alternative technological solution.

We've seen capitalism destroying the natural environment because the real impacts have been hidden. By revealing the full value of nature, you start to hold capitalism to account. After all, the economy is 100% owned by ecology, not the other way around.

"Adam Smith talked about the market's 'invisible hand'. Nature has one too"

- Gary Gillespie, Chief Economic Advisor to the Scottish Government

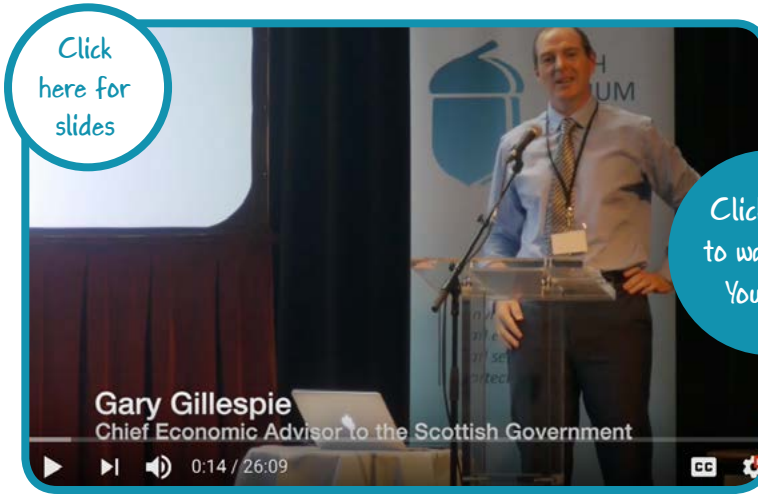
Capital is ingrained in how we think about the economy. We are comfortable talking about stocks of financial capital, social capital, human capital, and the flows of benefits they provide. For instance, education: social returns are stronger than private returns, but nobody bats an eyelid about investing in human capital - training, schools, skills, etc. So why not natural capital? I think it's to do with measurement, understanding the value and how it relates to other capitals.

Adam Smith talked about the invisible hand of the market. But nature has an invisible hand, too - it doesn't need a price necessarily, but people do need to understand what it provides in terms of economic benefit. The challenge for us is to integrate the economics with the ecology so that we can understand the flows of benefits that different sectors of the economy depend and impact on.

Scotland's Economic Strategy recognises natural capital alongside social, human, infrastructural and digital capital as something of national interest that should be protected and invested in to ensure a healthy and resilient economy. To measure the flow of services it provides, we developed an Asset Index and incorporated it into our National Performance Framework. It's a starting point, a set of metrics that people can debate and it will help us think about how to put a fuller set of national accounts around it.

Monetisation is another issue, and I know there's a different debate around that, but you must have some measurement of what you have and what you're degrading. Then you can have a debate about the investment criteria and how natural capital fits with the returns we get from the incremental pound in health, transport and physical infrastructure - and that's important for public policy.

Click here for slides



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"The challenge is to decide how much natural capital we need, and where"

– Kathy Willis, Director of Science at Kew

The natural environment is subject to competing demands from human society. We require different aspects of our natural capital in the landscape to deliver multiple benefits, and because we cannot have everything everywhere, there has to be some compromise.

The overarching aim should be to maximise/improve the number of societal benefits from landscapes. The challenge is to decide how much natural capital we need and where it should be, but first we have to identify what benefits we want from the natural environment, what services provide them, and what natural capital delivers those services.

We need to understand what we have in terms of our baseline of natural capital, and look to the future and decide what our natural capital targets are, and decide how to get there. There are large knowledge gaps in addressing how we meet societal targets.

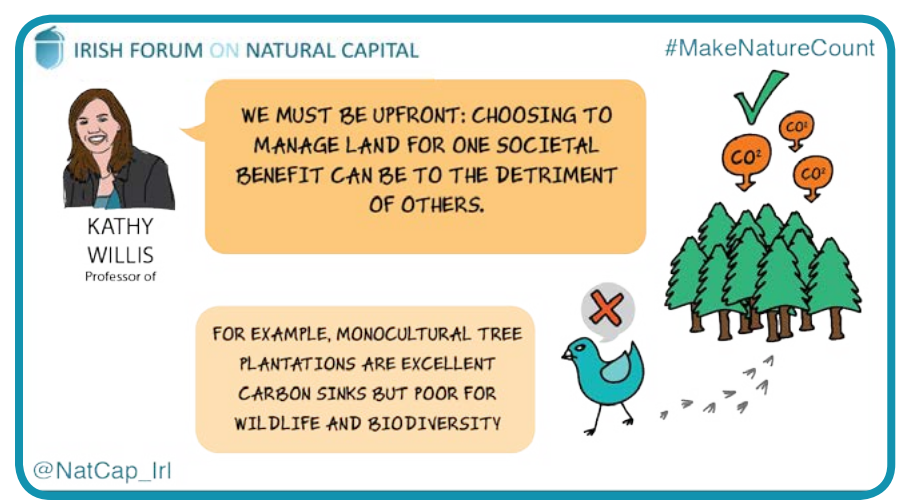
We need to be able to measure and monitor our natural capital, but there are still very few tools to quickly indicate important areas for natural capital improvement. We have data baselines in terms of habitat maps, soil maps, GBIF data and water maps, which we can use to map our natural capital assets.

We also need to identify the key ecosystem services we need in a landscape and map those. This is more of a challenge. For example:

- Pollination: map which crops require pollination services and relate that to the availability of pollinators in the landscape. At a large scale, this can help land managers identify areas to protect.
- Water flow regulation and run-off reduction: by mapping land cover and soil properties (such as freely/poorly draining soils), water regulation maps can be created to determine which type of land cover reduces or increases run-off.
- Carbon: woody vegetation maps can be a proxy for carbon storage.
- Recreation: Combining maps of the number of uploads of photographs to photo-sharing websites with species distribution could help understand how people value land culturally and recreationally.

We also need to be upfront about tradeoffs: a plantation forest may increase carbon storage but reduce biodiversity. In some situations, land can only be used for one purpose, e.g. fragile ecosystems may only be suitable for wildlife conservation. In these cases, where natural environments cannot be replaced, we need to conserve them now, rather than risk losing them. This requires planning and governance.

But who gets to decide? We need natural capital to be at the forefront of discussion at national and local government level, but there are still questions about how we govern natural capital.



"We must change all economic policy to take account of nature"

- Dieter Helm, Chair of the UK Natural Capital Committee

Natural capital is part of economy. It's a core input into a productive economy, along with physical capital and labour, and not some added-on extra luxury that can be afforded in the good times. Economics is the study of the allocation of scarce resources - and there isn't much more scarce than our atmosphere and our biodiversity. It's crucial.

We must change all economic policy to take account of the positive contributions to human welfare that come from managing natural capital properly. There will be 10-12bn people on the planet by 2050 and GDP of 3% growth p.a, which means the world will be consuming a minimum 16 times what it currently consumes. Unless we do this in a sensible, environmentally constrained way, the effects will be permanent and extremely damaging.

How do we integrate natural capital into economics? Natural capital is about assets. It's not a measure of ecosystem services - which derive from assets - it's about the assets themselves. If you want to talk about assets, first you need an asset register to know what you've got. Then you need to identify which are renewable assets and which are non-renewable assets, then you sort out which of the renewables are at risk by identifying the thresholds. These assets go into a balance sheet. It doesn't need to be perfect, but it does need to start somewhere, so begin with easy-to-grasp assets: a woodland, national parks, etc.

To maintain the set of natural capital assets, we must use capital maintenance. This means spending what's necessary to at least maintain natural captial intact, if the objective is the minimum of not letting natural capital decline. This means no depreciation - they are

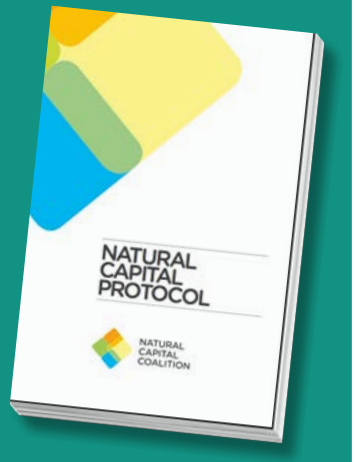
there in perpetuity. After you've maintained the asset, you can then declare what your national budget is - surplus or deficit.

Whatever the right level of natural capital is, we know that the current level is the wrong one. We have done an enormous amount of damage to the environment, and therefore to people, so on top of the natural capital maintenance, we need to add natural capital enhancement. Then the question becomes which enhancements should you do first? To decide, undertake a forensic examination of the economic benefits to society of the different ways in which natural capital stock could be improved, and rank them accordingly.

Natural capital is not sustainability. Sustainability is a woolly concept but natural capital is hard and rigorous. Accountancy isn't just for business - it's for the environment too.

BUSINESS SESSION

The Business Session explored how natural capital is being used by the private sector, with a focus on the Natural Capital Protocol. On the following pages, you can read short synopses of the talks, view the slides and watch the videos. Click on the photos below to jump straight to the relevant page.



Kathryn Jackson is the Technical Director at the Prince's Accounting for Sustainability Project (A4S). Her talk was titled 'How accountants can help save the planet'

Mark Gough is the Executive Director of the Natural Capital Coalition, the organisation that developed the Natural Capital Protocol. His talk was titled 'The business case for natural capital'

Will Evison is an Associate Director and environmental economist at PwC. His talk was titled 'Understanding natural capital impacts and dependencies with the Natural Capital Protocol'

Gordon Rogers is the Manager of Sustainability and Strategy at Yorkshire Water. His talk was titled 'Using the Natural Capital Protocol'

GLOSSARY

Natural Capital Protocol
A standardised framework for businesses to identify, measure and value direct and indirect impacts and/or dependencies on natural capital

Impact
The negative or positive effect of business activity on natural capital. The effect can be an increase, decrease, as well as the consumption or restoration, of natural capital

Dependency
A business reliance on or use of natural capital (e.g. clean water or natural flood protection

Natural Capital Assessment
The process of measuring and valuing relevant ("material") natural capital impacts and/or dependencies, using appropriate methods.

Materiality Assessment
In the Protocol, the process that involves identifying what is (or is potentially) material in relation to the objective(s) and application(s) of your natural capital assessment.

"There are business benefits from embedding sustainability in finance depts"

- Kathryn Jackson, Technical Director at The Prince's Accounting 4 Sustainability Project (A4S)

Often, the finance function within an organisation is seen as the gatekeeper who says 'yes' or 'no' to things. But there's more to it. Finance is responsible for identifying issues, ensuring information is robust and accurate, integrating new things into the business's processes and controls, setting strategies and developing targets. Sustainability should be part of this.

There are many business benefits from embedding sustainability within finance departments, including better decision-making, enhanced risk management, cost reduction, identification of business opportunities, and an improved reputation.

But despite the benefits, sustainability and finance aren't as well linked as they should be. Why? Common challenges we hear include being 'too stretched' with too many other things going on, it being 'too hard to do', senior management 'not being bought in', concerns around the accuracy of the data, and not being clear how finance can impact on sustainability.

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So how can these challenges be overcome? We identify four ways:

- Incentivisation - put targets in the organisation's rewards structure
- Investment - make sure that natural capital is upfront in appraisal processes when making big investment decisions
- Engaging - Work with stakeholders using qualitative and quantitative metrics to determine impacts and dependencies on natural capital
- Embedding - come up with a pilot to trial new projects, collect the metrics to determine the business case, and scale it up

To monetise or not to monetise? A lot of people think that when you talk about accounting, you're talking about monetary values. While some feel it's necessary, others say that there is enough alternative information available to make a decision - there isn't a consensus. At A4S, we talk about: 1) Identifying what's significant and material to an organisation around natural capital and broader societal impacts; 2) Quantifying those things, and 3) potential monetisation.

"Nature is the basis for all other forms of capital"

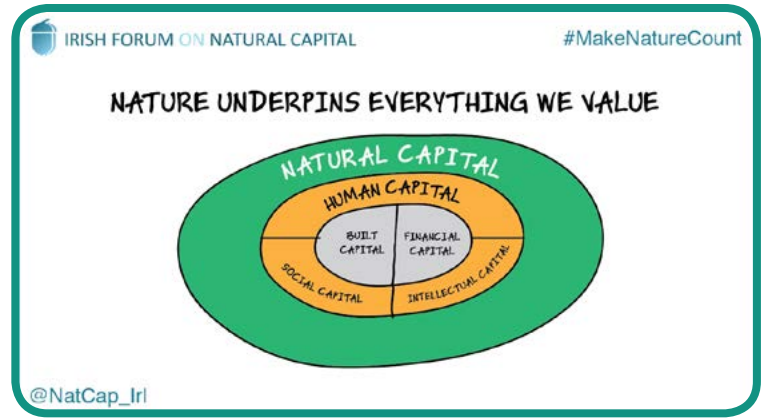
- Mark Gough, Executive Director of the Natural Capital Coalition

The Natural Capital Protocol helps businesses generate trusted, credible and actionable information in order to make decisions that take nature into account. Nature is the basis for all other forms of capital.

The Protocol isn't a reporting framework or a standard. Rather, it takes the standard decision-making process - Why are you going to do something? What are you going to do? How are you going to do it? and, So what? - and helps companies ensure that natural capital is considered at each stage.

The kinds of decisions it helps to inform can be part of a company's strategic planning, supply chain risk assessment, capital allocation, investment and operational decision-making, or external reporting.

38 organisations came together through the Natural Capital Coalition to develop the Protocol and were supported by hundreds more who took part in the piloting, engagement and consultation. Why? For most of them, they'd found a hole - a problem somewhere in their supply chain, a problem with the resources they were relying on, a problem with a decision they were trying to make - and they didn't know how to bring natural capital into the picture.



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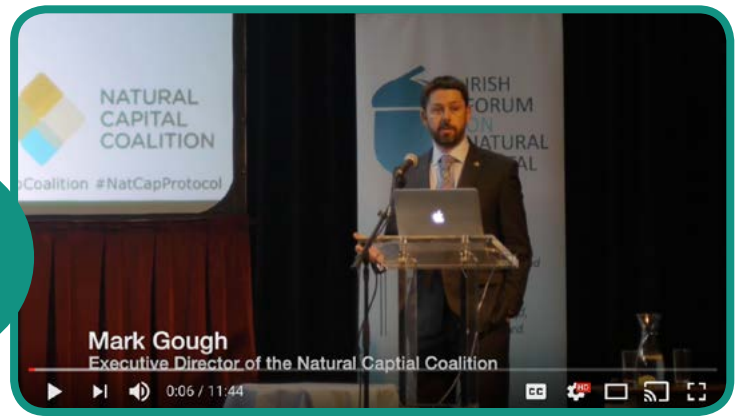


The Protocol helps to address these issues by enabling companies to:

- Identify and measure impacts and dependencies on nature by connecting with commonly-used environmental initiatives, such as Environmental Management Systems like ISO 14001.
- Value the relative importance, worth or usefulness of those impacts and dependencies using a variety of tools and methodologies.
- Integrate those values into existing decision-making processes by choosing the right data to inform the decision you need to influence.
- Define and deliver against strategy, as informed by initiatives such as the Sustainable Development Goals and the Paris Climate Agreement.
- Inform external disclosure by bringing natural capital into reporting initiatives like the Carbon Disclosure Project, Global Reporting Initiative, Integrated Reporting, etc.

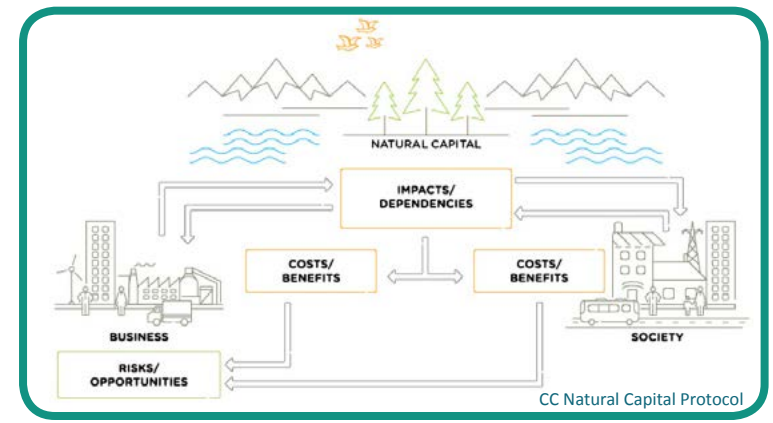
"Businesses and nature are interdependent"

– Will Evison, Assistant Director at PwC

Businesses impact and depend on natural capital in ways that create costs and benefits for both society and business. These costs and benefits present risks that businesses can avoid and opportunities they can exploit. Measuring and valuing them provides important insight into businesses' interdependence with nature.

But whose value perspective do we consider? The Natural Capital Protocol, which aims to engage business, makes a simplifying distinction between business value (or market value) and societal value (or non-market value, including externalities). A complete Natural Capital Assessment must look at both of these value perspectives.

Impact and dependency pathways are the foundation of a business's natural capital assessment. For example: A coffee factory depends on coffee plants which depend on pollinators. Natural capital changes and pollinators are lost. How can we value that dependency? One way is to estimate the cost of replacing the pollination service.



CC Natural Capital Protocol

Companies are using Natural Capital Assessments (NCAs) to assess:
1) dependencies at site level for conservation and restoration. A developer in Malaysia found that mangrove degradation through logging and encroachment was threatening their business and the regional economy. A NCA showed that the indirect and non-market value of the wetland was 200 times the timber value.

2) societal impacts in the whole enterprise and value chain for risk management and innovation. Luxury goods company Kering's NCA (its pioneering Environmental Profit and Loss (EP&L)) revealed the scale of the company's positive and negative impacts on natural capital and the value of those impacts to society. The company uses its EP&L in multiple business functions including stores, product design and material sourcing to manage its natural capital impacts and related risks.

3) societal and business impacts of national infrastructure to inform design. The Beauly-Denny Power Line upgraded 220km of electricity cables in Scotland. It required much taller pylons, which impacted on landscapes. The company wanted to know if the changes to the line outlined in planning conditions were worth the increased cost to the taxpayer. The NCA found that, by considering societal value, changing the line to reduce the negative impact on landscapes gave a £2.90 - £3.70 return on every £1 of taxpayers' money that was spent.

"The natural capital approach has helped us examine risks and opportunities"

- Gordon Rogers, Manager of Sustainability and Strategy at Yorkshire Water

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Peat degradation was having a negative impact on water quality in Sheffield. A longer-term catchment management plan to restore and protect the peatlands was ongoing, but a solution to acute problems was also needed. £24m of capital investment was made available to construct new infrastructure at Rivelin Water Treatment Works.

The site is adjacent to the Peak District National Park, so environmental and planning considerations were paramount. We decided to do a low-energy intensive, landscape-sensitive and green roof development. To find out if this decision also made sense from a natural capital perspective, Yorkshire Water became one of the first companies to pilot test the Natural Capital Protocol.

A materiality assessment identified four critical ecosystem services that the development would impact on: Climate Regulation, Air Quality Regulation, Pollination, Cultural/Spiritual. We attributed economic values to each and assessed them across three development options: 1) do nothing, 2) take a traditional, energy-intensive approach, and 3) our chosen option.

With help from experts at Aecom, our assessment valued the natural capital impacts to be -£10.87m for 'do nothing', -£7.55 for 'traditional', and -£6.99m for the chosen option. This shows we substantially reduced a net negative impact through our work. It wasn't a complete exercise - we didn't look at embedded emissions, for instance - but it did give us useful information and helped us broaden our examination of opportunities and risks, giving it structure and credibility.

There's a big debate about whether to economically value natural capital. As a sustainability person, I think 'Do you really need it?' But when I've presented the Rivelin case to finance people, project managers or directors, they have found it easier to understand a £10m carbon impact than the same impact presented in tonnes of emissions.

A public water company is totally reliant on nature, so natural capital should be at the heart of its business model. The Rivelin pilot has shown we can make a less 'bad' solution, but for any organisation to achieve a fully sustainable net positive solution, we need commercial expenditure for societal benefit. None of the costs in the Rivelin study are on a traditional profit and loss account - so how do we shift these things so that the polluter pays? Answering that question is our biggest challenge.

The results

Ecosystem Service	Baseline	Notional	Chosen	Valuation quality	Data quality
Climate regulation	-£11.0m	-£7.6m	-£7.2m	Good	Reason-able
Air quality regulation	£48k	£38k	£47k	Reason-able	Good
Pollination	£0	£0	£30k	Limited	Reason-able
Cultural & spiritual	£150k	£0k	£150k	Limited	Good
Total	-£10.78m	-£7.55m	-£6.99m		

Ecosystem service valuations of Yorkshire Water's three development options at their Rivelin site

NATIONAL EXAMPLES SESSION

The National Examples Session heard from Irish, Scottish, Dutch and Belgian representatives working on national-level natural capital initiatives. In a pre-recorded address, Ireland's Ambassador to the United Nations also offered his thoughts on the global governance context. On the following pages, you can read short synopses of the talks, view the slides and watch the videos. Click on the photos below to jump straight to the relevant page.

Ciaran O'Keeffe is the Principal Adivsor at the National Parks and Wildlife Service. His talk was titled 'Ireland's Approach to Managing Natural Capital'.

Joop van Bodegraven, is Staff Officer (Nature and Biodiversity) at the Netherlands' Ministry of Economic Affairs. His talk was titled 'Making Natural Capital Count in the Netherlands'

Jo Pike is the Deputy Chief Executive and Director of Public Affairs at the Scottish Wildlife Trust. Her talk was titled 'New opportunities, new priorities'

Maarten Stevens is Senior Scientist at the Research Institute for Nature and Forests (INBO), Belgium. His talk was titled 'Flanders regional ecosystem assessment: from concept to practice'

Ambassador David Donoghue is Ireland's Permanent Representative to the United Nations. He co-Chaired the Sustainable Development Goals. His talk discusses natural capital from a global governance perspective

"Natural capital demonstrates the benefits of nature for Ireland's citizens"

- Ciaran O'Keeffe, Principal Officer at the National Parks and Wildlife Service

Ireland is making a good start, but we are still at an early stage. A collaborative approach is essential and the Irish Forum on Natural Capital brings together a unique range of skills and knowledge sets.

Right now in Ireland, housing, jobs and flood mitigation are very high in the public priorities. Natural capital and ecosystem services provide an important opportunity to communicate the value of biodiversity and the need to maintain our natural capital stocks now. They demonstrate the short and long term multiple benefits of nature for Ireland's citizens, such as bogs for carbon sequestration, native woodland and wetland management for flood attenuation.

We have some great examples of how this approach can open dialogue with a wide range of stakeholders, such as the National Pollinator plan which was of immediate interest to the media, and is being supported by Bord Bia.

Action 5 of the EU Biodiversity Strategy to 2020 calls Member States to map and assess the state of ecosystems and their services in their national territory with the assistance of the European Commission. The objective of this action is to ensure that biodiversity is considered in the formulation of policies across all sectors.

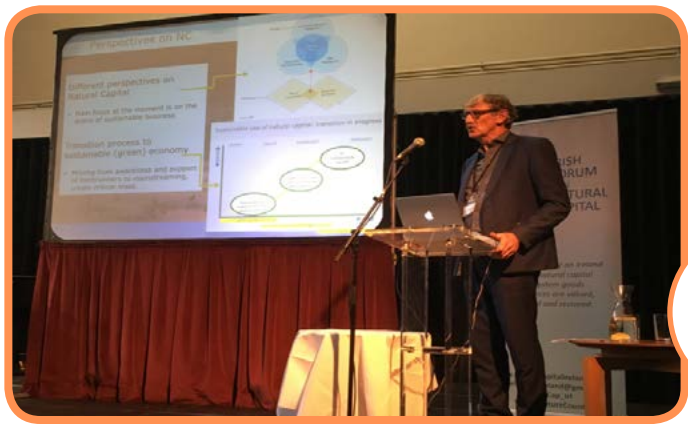
NPWS commissioned a pilot study to map and assess a suite of prioritised ecosystem services using available national data and the 'MAES' conceptual framework. Potential stock of ecosystem services were mapped and assessed based on biophysical and management characteristics. Qualitative weightings were determined through consultation with experts and other stakeholders and which provided opportunity promotion of awareness and discussion.

The project also aimed to identify key data and knowledge gaps. Key gaps include a national landcover and habitat map of higher resolution than CORINE, as well as data sources to be viable in the future, and suitable for scaling up to national level. Further work is required on mapping ecosystem condition nationally and to impacts on service provision and value of services.

Next steps: In addition to extending the national pilot to a local pilot area, NPWS will also prioritise work on the Memorandum to Government on Natural Capital and the coordination of a new National Biodiversity Action Plan (2017-2021), which as with the previous plan will be strongly linked to natural capital within the context of the Ecosystems Approach.

"In the Netherlands, natural capital is bridging the economy and ecology"

- Joop van Bodegraven, Staff Officer (Nature & Biodiversity) at Netherlands' Ministry of Economic Affairs



Click here for audio on YouTube

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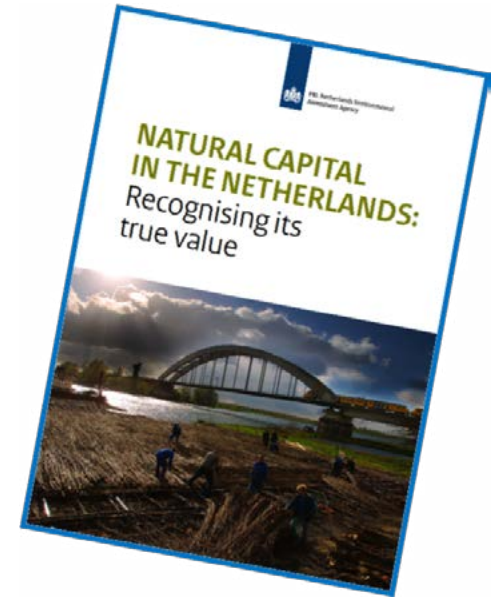
The Netherlands is densely populated, man-made country. Even our biggest wildlife area is a renatured former industrial site. Our society presents a lot of challenges: economic growth together with sustainable development and nature conservation is a really difficult issue in a country that has high economic ambitions.

In 2014, we brought out a new vision for nature ('The Natural Way Forward') that tried to bridge those different interests into one political statement that took us from protecting nature against society to working with nature for the benefit of society. That does not replace nature conservation legislation, but adds to it.

At a policy level, we have passed the early phase of raising awareness of the value of natural capital to create a critical mass and get attention within society. This started with a series of TEEB studies (The Economics of Ecosystems and Biodiversity), which aimed to develop a sense of the value of nature for society in areas such as urban development, health, rural development, business and trade. In the next phase we developed coalitions for business, the financial sector and consultancy firms and we aim to scale this up and transfer the momentum to society.



In the last few years, we have surveyed the practice and possibilities for institutionalising the natural capital way of thinking in pilot projects on water management, international trade, the Common Agriculture Policy, and many other fields. The lessons from these projects are summarised in a report 'Natural Capital in the Netherlands: Recognising its true value'. Additionally, we are developing an online resource 'Atlas Natural Capital', from which we will build our national natural capital accounts.

Closing remarks: the science of natural capital is not yet perfect, but it's good enough to identify risks and opportunities and prioritise them as a basis for action. We've found that natural capital really is something that can bridge economy to ecology in many different ways and in many arenas, but it's important to respect the different semantics and narratives of different disciplines, and to cherish the frontrunners. Lastly, in the end, it's behaviour change - not accounting - that counts.

"We mapped supply, demand and sustainable use of 16 Ecosystem Services"

– Maarten Stevens, Senior Scientist at the Research Institute for Nature and Forests (INBO), Belgium

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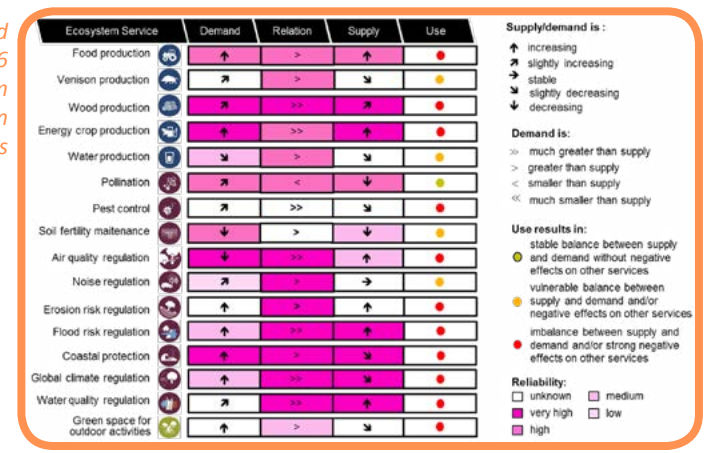
Every two years, we are required to report on the state of nature in Flanders. In 2014, we started a 3-phase ecosystem assessment: 1) a state and trends report, which is complete. 2) a report putting ecosystem services to work, which is being done now. 3) is a report about creating scenarios for green infrastructure.

We started with a conceptual framework that identifies the connections between natural capital and societal welfare/wellbeing (through ecosystem services, impact drivers and governance), and used it to map and assess 16 ecosystem services. For each, a separate report was made and we mapped supply, demand, use and, in some cases, valuation of the ecosystem services. These 16 reports then formed the basis of a thematic report that aimed to explore the links between biodiversity and ecosystem services, how you do valuation, and the state and trend of the 16 ecosystem services. The review process was heavy, but worth it: 53 authors and 179 reviewers.

Using a confidence rating to denote the reliability of the data, we identified the levels of supply and demand for each ecosystem service (a combination of qualitative and quantitative data). Further analysis shows whether or not supply and demand are in balance ('Relation' column), and this is synthesised in a traffic-light system to indicate sustainability of use ('Use' column). See image below.

The state and trends of 16 ecosystem services in Flanders



Phase 2 took us from the theory above to an exploration of how the ES concept can be used by Flemish policy, but there have been challenges. The concept is complex and people who aren't familiar with ecosystem services aren't using the available tools, so translating knowledge for local practitioners is important. Also, there are a lot of existing frameworks (WFD, Natura, CAP) and it's hard to make those Directives think beyond their main focus. Finally, you need good examples of natural capital approach working on the ground, which means you need the frontrunners and the bridging organisations to scale up.

"The biggest thing we've learned is to create the space in which action happens"

- Jo Pike, Scottish Forum on Natural Capital and Deputy Chief Executive at the Scottish Wildlife Trust

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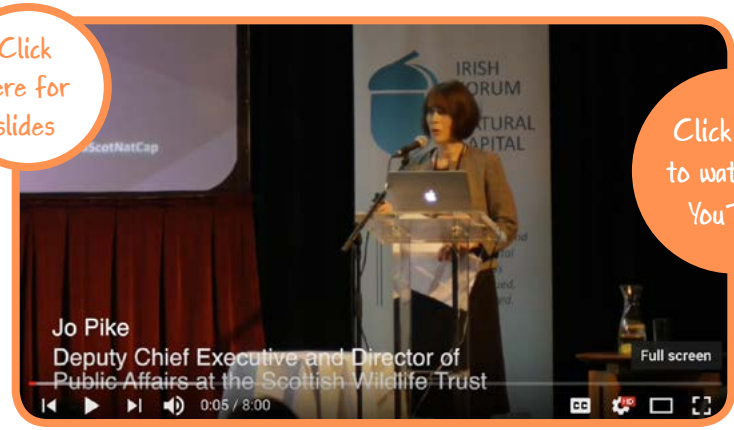

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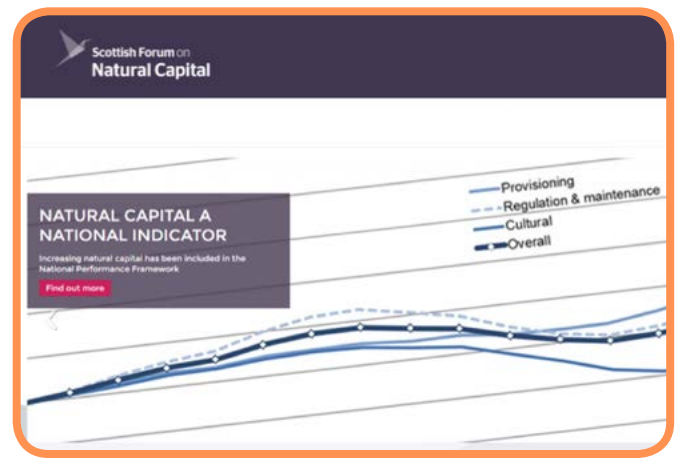
The Scottish Forum on Natural Capital brings together senior decision-makers in the public, private and voluntary sectors with the aim of protecting and enhancing Scotland's natural capital. The founding partners include the Scottish Wildlife Trust, Scotland's 2020 Climate Group, the Institute of Chartered Accountants of Scotland, the Institute of Directors (Scotland), and the University of Edinburgh.

What have we achieved since we launched in 2013? The most important achievement is the inclusion of natural capital as a metric in the National Performance Framework, which measures all aspects of the Scottish Government's progress. The key stepping stone was the inclusion of natural capital as a concept in the narrative to the Scottish Government's Economic Strategy. For something like this to happen, people need people to have conversations, so we facilitated these in order to inform both the narrative and the priorities of Government.

We made a conscious decision to learn what we can about our audiences. We organised a survey of business leaders and, of the 500 respondents, a lot had never heard of natural capital. We used the survey to explain what we meant, and once they understood, 78% felt that action to protect our natural capital is urgent or very urgent. A new survey of landowners and farmers, which is yet to be published, reflects very high potential for engagement among that audience too.

Our members told us that the three most important things for them are connection with others in this space, access to tools and collaborators, and the opportunity to demonstrate leadership.

The biggest thing we've learned is that we can't establish projects and deliver action ourselves - we can't ever have the impact on the scale we want if we do it all within the Scottish Forum. It's about creating the space in which action can happen. We're prioritising impact through policy and legislation, impact through knowledge and innovation, and impact through catalysing action.



Scotland's Natural Catpital Asset Index is used as an indicator of the Government's performance on increasing natural capital, an objective set out in its National Economic Strattegy

"Above all we must recognise the interdependence of everything"

- Ambassador David Donoghue, Ireland's permanent representative to the United Nations

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It's just over a year since world leaders adopted by consensus the 2030 Agenda for Sustainable Development. This agenda comprises 17 sustainable development goals (SDGs) and 169 targets or subsidiary goals. It requires all of us, all 193 Member States of the UN as well as the UN system, to transform what we are each doing so that together we can transform the world in which we all live. As Ireland's Ambassador to the UN, I was appointed along with my Kenyan counterpart to co-chair the negotiations which produced this agenda.

There was a strong sense on the part of who negotiated this new agreement that a 'business as usual' approach would not suffice. The SDGs are a blueprint for global action over the next 15 years on the key challenges facing both humanity and the planet. Nothing as ambitious or as comprehensive as this has ever been undertaken before.

You are advocates for the 'natural capital' concept which seeks to unite economic and environmental interests. You know that truly transformative work does not happen in isolation. 'Natural capital' does not appear as such in the 2030 Agenda. However, I very much recognise the concept and its values in the way in which the Agenda weaves together all of the issues which affect everyone living on this planet.

Some Goals are immediately relevant to natural capital:

- Goal 7 on affordable, reliable, sustainable and modern energy
- Goal 9 on resilient infrastructure and inclusive, sustainable industrialisation
- Goal 11 on inclusive, safe, resilient, sustainable cities and human settlements
- Goal 12 on sustainable consumption and production patterns
- Goal 13 on climate change
- Goal 14 on ocean conservation
- Goal 15 on protecting eco-systems

Now, as we work collectively at the global, regional and national levels to establish the systems and strategies needed to deliver on each of the agreements reached in 2015, it's important above all that we recognise the interdependence between everything.

The challenge at Member State and at UN level is, for example, to come up with economic development policies which take into account the environmental impact of these policies. Another challenge is to revise industrial and agricultural policies so as to respect the commitments made in Paris. I cannot emphasise enough that this is a new way of doing business.

RESEARCH SESSION

The Research Session focussed on natural capital and ecosystem service science in Ireland. We heard from researchers at Trinity College Dublin, University College Dublin and the National University of Ireland, Galway. On the following pages, you can read short synopses of the talks and watch the videos. Click on the photos below to jump straight to the relevant page.

Dara Lynott is the Deputy Director General and Director of the Office of Environmental Sustainability at the EPA. His talk was titled 'An Introduction to Natural Capital Research in Ireland'

Yvonne Buckley is Professor of Zoology at Trinity College Dublin. Her talk was titled 'Managing natural capital for ecosystem service provision'

Mary Kelly-Quinn is a lecturer in the Zoology Dept, University College Dublin. Her talk was titled 'EsManage - Incorporation of Ecosystem Services Values in the Integrated Management of Irish Freshwater Resources'

Stephen Hynes is the Scientific Director of the Whitaker Institute and senior lecturer in economics at the National University of Ireland, Galway. His talk was titled 'Valuing Ireland's marine ecosystem services'

Caitriona Carlin is a researcher with the Applied Ecology Unit at the National University of Ireland, Galway. Her talk was titled 'What do greenspace decision makers value in relation to health benefits from nature?'

"The EPA is all about trying to protect the environment - now and into the future"

- Dara Lynott, Deputy Director General & Director of Environmental Sustainability at the EPA

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The EPA is all about trying to protect the environment now and into the future, and we do this through three activities: regulation, knowledge development and advocacy. Part of the advocacy is supporting conferences such as this.

In regulation, we have a huge role in Strategic Environmental Assessment (SEA) where we are trying to spread the message around environmental integration into plans and programmes at Government level.

Also, in recent years, we have been given roles in Environmental Impact Assessment (EIA) and Appropriate Assessment (AA). AA is a tricky one - it's probably the fastest-developing and most contested area in terms of screening in or out whether an AA has to be done under the Habitats Directive.

In terms of knowledge, we have significant mapping programme that pulls together environmental data and makes it available to the public through our website.

We're also the national centre for environmental research, and through that programme we have funded many projects: €9.2m on the biodiversity theme (58 projects between 2000 and 2013), €2.1m on the natural capital theme (10 projects since 2014), and €0.9m on the environment and health theme (since 2014).

Research in this area includes projects on prevention, control and eradication of invasive species, a framework for the restoration of degraded peatlands, valuing the significant ecosystem services provided by marine and estuarine habitats, managing invasive alien plants in Ireland, sectoral impacts on biodiversity and ecosystem services, sustainable management of peatlands, and biodiversity and environmental change.

"Natural capital asset management is not clear cut"

- Yvonne Buckley, Professor of Zoology at Trinity College Dublin

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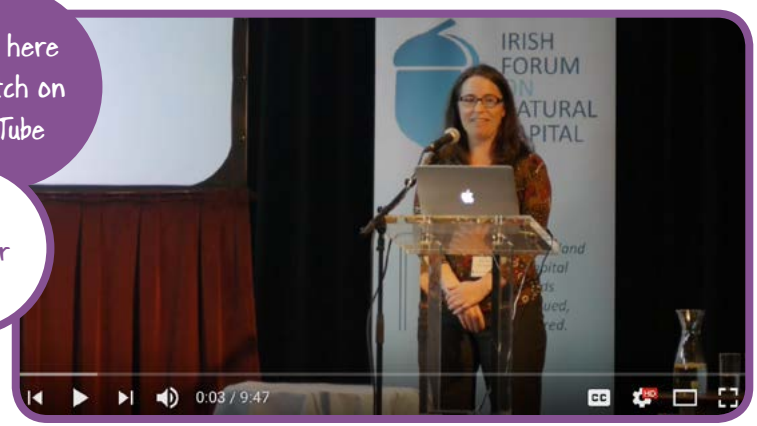
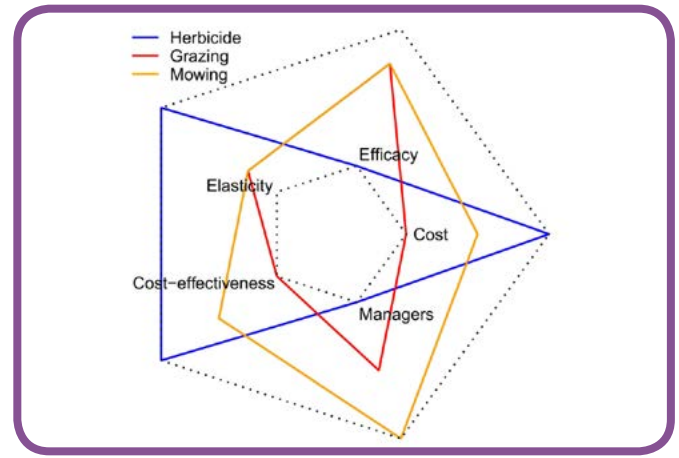


We can't lock away natural capital and expect it to continue to provide ecosystem services - often, we have to take actions to improve natural cpaital in order to maintain or enhance ecosystem service provision that in turn provides benefits to people.

Our research looked at how to manage natural capital assets. We mapped the flow of ecosystem services from those assets and looked at where management actions - like restoring bogs, managing invasive species, planting woodlands, etc. - fitted in. The answer was at the assets end: we can't manage ecosystem services directly, but we can change the quantity, quality and configuration of natural capital assets.These assets have attributes we can easily change (i.e. chopping woodland, planting woodland) and attributes are harder to change (i.e. the tensile properties of roots, clay properties of soil).

But natural capital asset management is not clear cut. For example: What's the best way to manage invasive pine trees in New Zealand? We looked at three management actions to see how best to reduce the pines' population growth rate beyond the level at which they can replace themselves.

We considered efficacy, cost, cost-effectiveness, elasticity and managers' preference. In an ideal world, the most successful management action would be obvious - but it isn't. There are different measures of success in any system, and sometimes, they won't all align, in which case a decision needs to be made on what measure of success we want to use (see below).



Managing invasive pine trees in New Zealand: The several dimensions of "success" for management actions

"Experts highly value regulating services, but the public value cultural services"

- Mary Kelly-Quinn, Lecturer at University College Dublin

ESmanage is a three-year project that is due to finish in 2018, involving researchers in fish biology, freshwater ecology, hydrology, modelling and environmental economics. Our objective is to harness the knowledge and tools required to embed the Ecosystem Services framework into policy, decision-making and the sustainable management of water resources, as required by the Water Framework Directive.

The project will synthesise the current knowledge of freshwaters, identify ecosystem services, identify and simulate the effects of different management options, show how changes in water quality would impact key ecosystem services, undertake a valuation of those ecosystem services and make recommendations for policy.

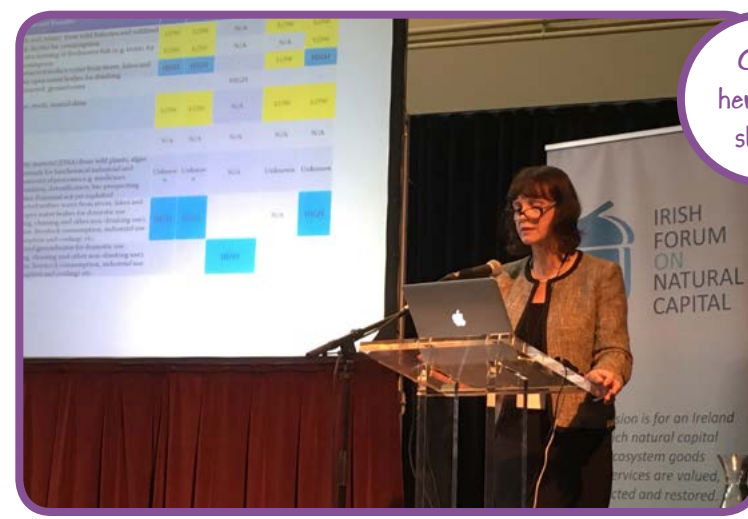
Our work so far considers how the ecosystem services framework might support the objectives of WFD. We have found that it:

- Illustrates links between human wellbeing and good water quality
- Enables comprehensive evaluation of the benefits and costs of improving water quality
- Improves understanding of who gains/loses from specific measures
- Connects ecological status to goods and benefits
- Provides a framework to integrate a range of disciplines

We have also completed an overview of the freshwater resource, identified present and future pressures, and identified some of the services derived across the range of freshwater resources, their relative importance and their likely responses to management decisions. We used the CICES framework to identify the ecosystem services and used a matrix approach to do a qualitative assessment of the relative importance of the services.

If we look at rivers and lakes combined, we can see that experts value regulating services most highly, followed by cultural and provisioning services respectively. However, stakeholder engagement is an important element of the ecosystem services framework, we are working on three test catchments to explore how the public value ecosystem services.

Pilot workshops have been conducted and while turnout was low, it's striking that most of what has been identified has been cultural services. Water provision wasn't identified as important and there was little recognition of regulating and provisioning services. We will engage a greater and wider range of stakeholders to identify the ecosystem services of importance, explore how levels of awareness affect the responses, and undertake the valuation exercises.



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"For sustainable growth, we need to consider all the marine's costs and benefits"

- Stephen Hynes, Scientific Director of the Whitaker Institute, NUI Galway

The Socio-Economic Marine Research Unit (SEMRU) is known for the production of ocean economy statistics, such as turnover and employment, but that's a surface-level analysis of the economic contribution of the marine environment. There's a whole host of other services that we haven't really looked at, and that's what this EPA project is about.

When we look at the sea we think of fishing, commerce and shipping, but there are other things that we value going on too: aesthetic values, waste assimilation, recreation, carbon sequestration, cultural inspiration through art and music.

At EU and national levels, policy has made the need for economic analysis explicit, so we need to be able to say somthing about achieving good environmental status, the ecosystem services and the benefits that they provide to society, as well as their value.

To support sustainable growth across marine industries and sea basin strategies, we need to consider all the costs and benefits. Doing this can help with decision-making and protection of the marine environment (for example, we can value the ecosystem services we get from saltwater marshes or kelp beds in terms of storm surge alleviation to inform decisions about climate change mitigation and adaptation).

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It also can help to communicate the importance of marine ecosystems, assess the cost of natural resource damage, inform national environmental accounts, set a framework to guide market-based instruments (such as tax incentives, fees and subsidies), as well as guiding national and international strategies and directives.

A key problem is that we don't fully understand the ecosystem's functions and processes, so before we get to valuation, we have an issue around ensuring we understand the ecosystem cascade from the functions and processes, services and benefits, down to the values. In this project we used the UN CICES classification system to see what we could value based on the literature:

- Provisioning Services:

Using market prices, we estimated off-shore fisheries = €472m, inshore fisheries = €42m, aquaculture = €148m, seaweed harvesting = €4m.

- Regulating Services:

Using a variety of methods, we estimated that certain waste assimilation services are in the order of €317m, coastal defence services €11m, and CO2 absorption services €855m.

- Cultural Services:

Again using a variety of non-market valuation methods, we estimated recreational services to be in the region of €1,700m, scientific and educational €11m and certain aesthetic services €68m.

"Better communication is needed between urban green space decision-makers"

- Caitriona Carlin, Researcher at the Applied Ecology Unit, National University of Ireland, Galway

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In 2015, the first ever national survey of health and wellbeing was done under the 'Healthy Ireland Framework'. It found that 13% of respondents thought there was a problem with the lack of open, accessible green space.

Who makes green space available to us? What's important to them? Are those values shared or do they differ? And what are the implications for the rest of us? Our study identified five different types of green space decision-maker: 1) Planners, 2) Engineers, 3) Local Authority staff (including landscape architects, heritage and biodiversity officers, and parks staff), 4) Local conservation staff, and 5) Health practitioners.

We asked them questions about what they value in relation to the health benefits we get from nature. All stakeholders strongly agreed that contact with nature benefited their health and wellbeing, that it helped to reduce their stress levels and helped them feel fitter. They also agreed that when they connect with nature, they are motivated to look after and protect it.

But, unsurprisingly, they didn't agree on everything. Only the engineers agreed that a big green area for sport is much more important than areas of biodiversity, and that playgrounds were much more important than wild areas. They also preferred neat and tidy areas. Planners and health promotion officers both preferred open areas to closed, woodland areas in urban settings.

These results point to a need for better communication. All our different stakeholder groups need to talk to each other about what's of value to them, and they also need to talk to the communities that the public green spaces they design, create and manage must accommodate us throughout our lifespans.

One of the key points that urban green space decision-makers disagree on

FRINGE EVENTS

As well as the conference itself, we also organised a range of fringe events, including:

A **series of six webinars** - see the next page for details and links to listen back online

A **public lecture from Tony Juniper** at Trinity College Dublin

An **academic discussion** featuring a Craig Bullock (UCD), Patrick Bresnihan (TCD) and Yvonne Buckley (TCD), and chaired by Ella McSweeney

A **Business Breakfast Briefing** with Will Evison (PwC), Gerry Ryan (Bord na Mona) and Prof Jane Stout (TCD), hosted by Bank of Ireland

WEBINARS

During the week of the conference, we held a series of free webinars in collaboration with the Ecosystems Knowledge Network. You can listen back to all of the webinars here

1) Applying the Natural Capital Protocol
The Natural Capital Protocol is a global standardised framework designed to help generate trusted, credible, and actionable information to inform decisions. In this webinar, Mark Gough, Executive Director of the Natural Capital Coalition gave an overview of the Natural Capital Protocol and associated sector guides. Gordon Rogers from Yorkshire Water described their piloting of the Protocol at their Rivelin Water Treatment Works.

2) Payments for Ecosystem Services: from concept to reality
Payments for ecosystem services (PES) is a term used to describe a range of schemes through which the beneficiaries, or users, of ecosystem services voluntarily provide payment to the stewards, or providers of those services. The beneficiaries may be individuals, communities, businesses or public bodies. This webinar took stock of progress and discussed how the PES concept might be applied in a European context. It was presented by Steve Smith; Technical Director at Aecom and lead author of several major reports on PES.

3) Addressing local health priorities through improved access to nature
The natural environment has always been part of the health service, preventing ill-health and helping people to address health problems once they have arisen. While the evidence for the health benefits of access to the natural outdoors is strong, practical action in response to this remains very patchy. Long-lasting outcome-oriented partnerships between organisations in the environmental sector and those working at the core of the health system are only just beginning to emerge. This webinar examined a range of possible responses to this challenge. It was presented by Rachel Stancliffe, Director of the Centre for Sustainable Healthcare.

4) Natural capital accounting at the local and landscape scale
Organisations typically assess the value of their assets through conventional financial accounting processes. Most of the benefits arising from natural capital do not appear in these accounts. In response, a framework for corporate natural capital accounting has been developed and accounts are being produced for discrete areas of land such as public parks and private estates. In this webinar, Sarah Krisht and Philip Cryle from environmental economics consultancy eftec introduced some of the innovative local and landscape-scale natural capital accounting work they have been involved in to date.

5) Mapping the connection between the environment and people's needs
Describing the positive relationship between the environment and people can be challenging. Maps of ecosystem services can be useful starting points for dialogue about this topic, identifying opportunities for action and investment. This webinar will introduce the growing field of ecosystem service mapping, highlighting some of the tools available to do this. It will be presented by Bruce Howard, Ecosystems Knowledge Network.

6) Incorporating ecosystem services into environmental assessment
Ecosystem services are becoming increasingly prominent as a framework for linking the environment and people's well-being. There is strong interest in what ecosystem services mean for processes such as Environmental Impact Assessment, Strategic Environmental Assessment and Sustainability Appraisal. One key difference is the framing of the natural environment as an opportunity or benefit as opposed to a constraint or backdrop to absorb impacts. This webinar by Bill Sheate of Collingwood Environmental Planning will introduce the topic, pointing to some of the resources and examples available.

KEY TERMS

Natural Capital: *The 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.*[2]

Ecosystem Services: *The flows of benefits to people from ecosystems, commonly divided into the following* [2]*:*

- ***Provisioning*** *- Goods obtained directly from nature (e.g. crops, water, fibre, genetic material)*
- ***Regulating*** *- Indirect benefits from nature (e.g. mitigation of climate change as carbon is sequestered in vegetation, water filtration by wetlands, erosion control and protection from storm surges by vegetation, crop pollination by insects)*
- ***Cultural*** *- Intangible benefits from nature (e.g. outdoor recreation, spiritual inspiration, mental health, education)*

ECOLOGICAL TERMS

Biodiversity: *The variability among living organisms from all sources, including terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part. Biodiversity includes diversity within species, between species, and between ecosystems.*[3]

Ecology: *the study of interactions between living-organisms, and between organisms and the non-living environment.*

Ecosystem: *A dynamic complex of plant, animal, and microorganism communities and their non-living environment interacting as a functional unit.*[3]

Ecosystem Function: *A subset of the interactions between ecosystem structure and processes that underpin the capacity of an ecosystem to provide goods and services.*[3]

Ecological Value: *Non-monetary assessment of ecosystem integrity, health, or resilience, all of which are important indicators to determine critical thresholds and minimum requirements for ecosystem service provision.*[1]

ECONOMIC TERMS

Benefits: *Positive change in wellbeing from the fulfilment of needs and wants.*[1]

Economics: *The study of the allocation of scarce resources among competing desirable ends.*

Economic (adj): *Justified in terms of profitability. See also Uneconomic (adj): constituting an inefficient use of money or other resources.*

Externalities: *A consequence of an action that affects someone other than the agent undertaking that action and for which the agent is neither compensated nor penalized through the markets. Externalities can be positive or negative.*[1]

Price: *The amount of money expected, required or given in payment for something (normally in the presence of a market).* [2]

Value (n): *The importance, usefulness or worth of something.*[2]

Valuation: *The process of expressing a value for a particular good or service in a certain context (e.g., 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).*[3]

TYPES OF VALUE

Total Economic Value: *The value obtained from the various constituents of utilitarian value, including direct use value, indirect use value, option value, quasi-option value, and existence value.*[1] *Each of these is explained below:*

Direct Use Value: *The benefits derived from the services provided by an ecosystem that are used directly by an economic agent. These include consumptive uses (e.g., harvesting goods) and non-consumptive uses (e.g., enjoyment of scenic beauty). Agents are often physically present in an ecosystem to receive direct use value.*[3]

Indirect Use Value: *The benefits derived from the goods and services provided by an ecosystem that are used indirectly by an economic agent. For example, an agent at some distance from an ecosystem may derive benefits from drinking water that has been purified as it passed through the ecosystem.*[3]

Sources: 1) TEEB Glossary (no date); 2) The Natural Capital Protocol (2016), 3) Millennium Assessment (2005)

Option Value: *The value of preserving options for future use of an environmental resource that may be lost irreversibly, given expected growth of knowledge.[1] (A bit like an insurance policy.)*

Non-Use Value: *Benefits which do not arise from direct or indirect use[1] (such as Existence, Bequest or Altruistic Value). These are explained below:*

Existence Value: *The value that individuals place on knowing that a resource exists, even if they never use that resource (also sometimes known as conservation value or passive use value).[3]*

Bequest Value: *The importance individuals attach to a resource that can be passed on to future generations, reflecting intergenerational equity concerns.[1]*

Altruistic Value: *The importance which individuals attach to a resource that can be used by others in the current generation, reflecting selfless concern for the welfare of others (intragenerational equity concerns).[1]*

MEASURING VALUE

Valuation Techniques: *The specific method used to determine the importance, usefulness or worth of something in a particular context.[2]*

Expressing Value: *An assessment may value natural capital in quantitative, qualitative and/or monetary terms:[2]*

- ***Qualitative** valuation describes natural capital impacts or dependencies and may rank them into categories such as high, medium or low.[2]*
- ***Quantitative** valuation uses non-monetary units such as numbers (e.g. in a composite index), areas, mass or volume to assess the magnitude of natural capital impacts or dependencies.[2]*
- ***Monetary** valuation uses money as the common unit to assess the values of natural capital impacts or dependencies (NC I&D). As well as aiding comparison to other NC I&D, this can be helpful to give a sense of scale relative to financial values (e.g. business costs and revenues), which are already expressed in monetary units.[2]*

Biophysical Valuation: *A method that derives values from measurements of the physical costs (e.g., in terms of labour, surface requirements, energy or material inputs) of producing a given good or service.[1]*

Economic Valuation: *The process of expressing a value for a particular good or service in a certain context (e.g., of decision-making) in monetary terms.[1] Methodologies include:*

- ***Direct market approaches, which use commercial market prices to value changes in the quantity or quality of a good or service, such as:***

Market price-based approaches – typically used for provisioning services for which a market already exists e.g. food, timber, cotton, minerals

Cost-based approaches – estimates of the cost of artificially replicating the ecosystem service, e.g. hard-engineering flood defences versus catchment-scale integrated water resource management

Production-function based approaches – typically used for regulating services to estimate how much they contribute to the delivery of another service/commodity that is traded on an existing market, e.g. the contribution of flood regulation to food provision

- ***Revealed preference approaches, where choices people make in existing markets are related to the ecosystem service being valued, such as:***

Travel cost method – used to determine recreational values by looking at the cost (direct expenses and opportunity cost of time) of visiting a site

Hedonic pricing – often used with regards to property, in that the proximity of a house to water or a forest could increase its value

- ***Stated preference approaches, where a market is effectively simulated via surveys on hypothetical changes to ecosystem services***

Contingent valuation – uses questionnaires to ask people how much they would be willing to pay to improve an ecosystem service, or how much they would accept for its loss or degradation. Typically used for ecosystem services where no market exists.

Choice modelling – uses alternative scenarios to assess the decision process of an individual

Group valuation – Combines stated preference techniques with elements of deliberative processes from political science

SURVEY FEEDBACK

How would you rate the conference overall?

★★★★½

(4.25/5)

How would you rate the variety of speakers?

★★★★

(4.1/5)

How would you rate the quality of material you heard?

★★★★

(4/5)

How would you rate the format?

★★★★

(4.1/5)

Was the conference good value for money?

★★★★

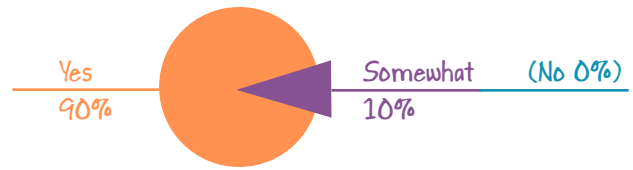
(4.1/5)

How easy was the registration process?

★★★★½

(4.6/5)

Do you feel you have a better understanding of natural capital concepts, having attended this conference?



What kinds of events would you like to see from us in the future?

1st: Practical Workshops
2nd: More like this conference
3rd: Thematic conferences
4th: Shorter information sessions
5th: Short webinars

What could we have done better?

Synopsis of comments:

- More on tools, techniques and practical application
- More philosophical discussion and critique
- More Irish speakers
- More time for Q&A and discussion
- Fewer presentations, or more breakout sessions
- Screen was too small and too bright

The data presented here are based on the responses of 44 conference delegates who completed the survey in October 2016.

Speakers and Organisers, left to right: Stephen Hynes, Gary Gillespie, Mary Kelly-Quinn, Jo Pike, Mark Gough, Jane Stout, Will Evison, Hannah Hamilton, Kathy Willis, Tony Juniper, Gordon Rogers, Kathryn Jackson, Maarten Stevens