Appendix

Bridging the Financing Gap. A discussion paper (March 2018)

This appendix contains details of, and provides some supplementary material on the data sources and issues contained in the document 'Bridging the Financing Gap – How do we increase financing for conservation? A discussion paper (RSPB 2018)

Page 12 The current state of play within the conservation sector

New and innovative financing has been a theme in conservation for over two decades. Conservationists have been active in developing new approaches to financing like Payment for Ecosystem Services (PES) schemes, biodiversity offsetting and cap and trade schemes. These schemes can be motivated by a desire to:

a) Control pollution of emissions (carbon, nitrates)
b) Ration the use of scarce resources (water)
c) Compensate for the loss of nature (biodiversity offsets)
d) Attach a revenue stream to encourage the provision of valuable but 'free' services (PES schemes)

Broadly speaking, these schemes are designed to reduce biodiversity loss or reverse the damage already done. Its has proved very difficult to scale up action in the absence of government support.

Page 13 Saving Nature is great value

Domestic biodiversity

The requirement: £2.3.bn per year is a minimum amount based on land management requirements. Further spending would be necessary for species management, law enforcement and public engagement but of an order of magnitude smaller than the land management costs. Small changes to the assumptions, such as incentive payments for farmers, in these calculations would easily rise these costs to £3 billion. See M. Rayment (2017) "Assessing the costs of Environmental Land Management in the UK – Final Report", commissioned by: The RSPB, The National Trust, and The Wildlife Trusts.

The estimated actual Spend of £476mn per year is calculated by augmenting the DEFRA UK biodiversity spend estimates with European Union LIFE spending in the UK. NGO spend is estimated at a further £200 million but it is impossible to prevent very significant double counting with the figures available.

Total Government spending 2016/7 was approximately £770.3 billion, for total annual GDP we use £1.8 trn and UK Assets under management is £5.7 trn (see page 19 of the main paper)

International biodiversity

The requirement. Is estimated at US$ 150 bn. A 2011 study conducted for the Secretariat of the Convention of Biological Diversity concluded that it would take between US$77 and US$81 bn per annum to achieve and maintain 17% terrestrial and 10% marine protected area as per Aichi target 11. The report concluded that the cost of satisfying all 20 of the Aichi targets lies somewhere between US$150-US$440 bn per year. In 2012, a study by Donal McCarthy and colleagues used Important Bird Areas (IBAs) as a corollary for biodiversity more broadly and concluded that if the world's total IBAs (just over the Aichi target of 17% of terrestrial surface) were to be effectively protected and managed the cost would be 57.8 billion USD per year. They extrapolated from this to conclude that the costs of securing and maintaining a global network of protected areas would be 76.1 billion USD annually — essentially corroborating the CBD's estimates. We use the low estimate for the Aichi targets in the table ($150 bn). To put that in context, we spend over US$ a year on pet care products. See McCarthy, et al., "Financial Costs of Meeting Global Biodiversity Conservation Targets: Current Spending and Unmet Needs," *Science* 338, no. 6109 (2012): 946-949.

Estimated actual spend is US$20.5 bn. According to a study by Waldron et al. the total annual expenditure on global biodiversity conservation between 2001 and 2008 was approximately 21.5 billion USD. See Waldron et al., "Targeting global conservation funding to limit immediate biodiversity declines," *Proceedings of the National Academy of Sciences of the United States of America* 110, no. 29 (2013): 12144-12148

In 2016, global GDP was estimated at US$ 75.4 trn, global assets under management were US$85 trn in 2016 (pwc estimate) and the Total stock of global financial assets were estimated at US$294 trn in 2014.

If spending US$150bn a year protects the delivery of global ecosystem goods and services, recently valued at US$142 trn that gives a cost benefit ratio of nearly 1000:1. A compelling investment case! This estimate of benefit is necessarily very approximate and faces a number of methodological hurdles but it does provide food for thought. It would need to be wrong by an order of magnitude for investing in nature, purely for economic reasons, not to make sense. See Costanza et al Global Environmental Change. May 2014, 26: 152-158 for the estimates of global ecosystem service benefits.

Sustainable Development Goals (SDGs)

The SDGs represent a concerted effort to shift the global economy – developed as well as developing – onto a more sustainable trajectory of long-term growth and development. Global environmental objectives are entwined with economic and social objectives in the SDGs. The United Nations Conference on Trade and Development (UNCTAD) says achieving the SDGs will cost between US$5 to $7 trillion per year, with an investment gap in developing countries of about $2.5 trillion. At the same time, the most recent OECD DAC report shows that in 2016 the total official development assistance reached a peak of $142.6 billion - one order of magnitude smaller than estimated needs.

Convention on Biological Diversity High-level Panel on Global Assessment of Resources for Implementing the Strategic Plan for Biodiversity 2011-2020, "Resourcing the Aichi Biodiversity Targets: A First Assessment of the Resources Required for Implementing the Strategic Plan for Biodiversity 2011-2020." Available at https://www.cbd.int/doc/meetings/fin/hlpgar-sp-01/official/hlpgar-sp-01-01-report-en.pdf (accessed June 1, 2016

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Page 14 We are losing biodiversity at an accelerating rate

The Condition and Trends Working Group of the Millennium Ecosystem Assessment (2005) found that over the past 50 years, humans have changed ecosystems more rapidly and extensively than in any comparable period of time in human history, largely to meet rapidly growing demands for food, fresh water, timber, fibre and fuel. This has resulted in a substantial and largely irreversible loss in the diversity of life on Earth. In addition, approximately 60% (15 out of 24) of the ecosystem services it examined are being degraded or used unsustainably, including fresh water, capture fisheries, air and water purification, and the regulation of regional and local climate, natural hazards, and pests.

The UNs Global Biodiversity Outlook (2016) subsequently found that extrapolations for a range of indicators suggest that based on current trends, pressures on biodiversity will continue to increase at least until 2020,and that the status of biodiversity will continueto decline.

Large scale analyses has documented the loss of biodiversity and has also looked at the relationship between these losses and the consequences for humanity.
See Biodiversity loss and its impacts on humanity for a comprehensive review paper (2012) which represents the current scientific consensus.

In the UK see State of Nature (2016) and UK NEA (2011) for further information

For more on the 'great acceleration' see this 2015 paper updating the original research published in 2004. The dominant feature of the updated paper is that the economic activity of the human enterprise continues to grow at a rapid rate. This emphasises the need, not only to restore the damage already done to nature but also to find new ways to make human enterprise more environmentally benign.

Page 15 Tackling biodiversity loss

The DPSIR model emphasises the need for systems thinking when addressing environmental challenges. All such challenges we face, from climate change, food production, population growth or biodiversity loss, are global, complex and interrelated. It is not possible to separate these challenges and solve them in isolation.

Page 16 Humans benefit from nature

Nature provides humanity with a vast and varied array of life supporting and life enhancing benefits. The term 'ecosystem services' is now widely used among scientists and policy makers to highlight the importance of the environment (including biodiversity) in sustaining human livelihoods and underpinning prosperity. Monumental research endeavours have helped describe and measure the scale of these services. A recent estimate put the value of these services at US142 trn annually (see ccostanza et al reference on page 13 above). It follows that the loss of biodiversity, which underpins the delivery of these services, will ultimately affect economic outcomes. The global Millennium Ecosystem Assessment (MA, 2005) found that more than 60% of ecosystem services were being degraded or transformed undermining future human prospects. The Stern Review (2006) into the economics of Climate Change identified the vast economic costs associated with any failure to limit future emissions. Further evidence has emerged from the Economics of Ecosystem and Biodiversity (TEEB, 2010) and the UK's seminal National Ecosystem Assessment (original and follow-on reports) (UK NEA, 2011). Recent years has seen attention turn more towards the 'stock' of nature, termed

natural capital, which determines the quality and quantity of ecosystem services provided. Again the UK has been at the forefront of this thinking with the creation of the Natural Capital Committee.

Page 17 The benefits of nature are complex and hard to market

Some of these complexities and possible routes forward are described in the table below.

Problem	Considerations
Public goods	Many ecosystem services have public goods characteristics, they are non excludable, non rival or both. Private owners have no incentive to provide services than the beneficiaries do not pay for. The presence of public good characteristics (e.g. national defence) is one of the main justifications for government intervention in the provision of a service. Governments can provide the goods directly or use regulation, fiscal incentives of market measures to provide public goods.
Complex goods with no one to one correspondence between a service and a benefit	Simple goods are discrete and separable (a pizza or a haircut) and are easy to trade. With ecosystem services there is often no one to one relationship between a 'service' and a benefit. Several ecological features or processes may be needed for one benefit (e.g. recreation). Alternatively one ecological feature (water quality) may give rise to multiple benefits (wildlife watching, drinking, fishing, health). The latter case has given rise to the notion of bundling benefits. Is it possible to get the different beneficiaries to all contribute to the service provider? Bundling services for blended finance ?
Time inconsistency	Some services are delivered over time and will benefit future generations. Carbon avoided through restoring woodlands will deliver benefits over many decades beneficiaries will mainly be future generations, those incurring the costs of action will be the present generation.
Systemic properties	Many services are systemic in nature. Many economic services, in transport, telecommunications energy and water supply, are also systemic and require network approaches. The solution was traditionally to nationalise delivery and, more recently, to have specific regulatory approaches to manage private supply. Optimal delivery of ecosystems services will almost certainly require systems approaches to future delivery.
Measurement challenges	Measurement uncertainties arise from incomplete knowledge (epistemic uncertainty) and from the inherent randomness and variability in complex natural systems (aleatory uncertainty). This creates difficulty when assessing the human benefits of natural processes. We may be certain that woodland restoration will result in significant benefits to water quality, climate, air quality and recreation. Measuring such

	benefits accurately remains a major challenge. There are though many products and services traded on the basis of expected but uncertain benefits.
Need for other capital	Many services relate to the dynamic processes in nature, like soil creation, pollination or carbon sequestered. Others, such as the health benefits of nature depend on human behaviour and other capital and resources. Understanding the specific contribution of nature to such benefits can be hard to disentangle from the human elements.

By business model we mean the plan implemented by a organisation to generate revenue and make a profit from its operations. The model includes the components and functions of the organisation, as well as the revenues it generates and the expenses it incurs. Value creation and exchange is at the core of understanding business models.

Page 18 The current state of affairs in the Finance sector

The Stern Review (2006) framed climate change as the biggest example of market failure the world faced. The imperative for climate impacts to become material consideration for financial decisions is growing as a systemic risk issue. Additionally, finance faces the risk of stranded assets if carbon based assets are to remain unexploitable. In a sweeping assessment of the financial risks posed by global warming, Mark Carney acknowledged there was a danger the assets of fossil fuel companies could be left "stranded" by tougher rules to curb climate change.

Environmental degradation is symptomatic of the same market failings and requires the same attention. As with climate change, the Finance sector is uniquely placed to make a difference. Investors will, wittingly or unwittingly, be exposed to economic losses consequent on widespread ecosystem degradation. The Finance sector is, however, also uniquely positioned to improve natural capital outcomes through the opportunities they can derive from developing products and services which yield both positive environmental and financial outcomes.

Together with its collaborating partners, the Natural Capital Finance Alliance has already developed a number of tools and resources to aid different types of financial institutions to incorporate natural capital considerations within their business decision-making There are also a number of studies concluding that good ESG practices can result in better operational performance and therefore it is now increasingly common to integrate sustainability factors into investment analysis and management.

This link gives an example of the impact campaigns for divestment from fossil fuels and unsustainable activities are having.

Page 20 Impact investing

According to the UK Government's advisory group on social impact investing, the rise in popularity of Environmental, Social and Governance (ESG) investing has been accelerated by ia number of broader trends, including an increasing focus on climate issues, supported agreements such as the Paris Climate Accord. ESG is the forerunner of social impact investing. The growth in ESG over the past 10 years has enabled the investment approach to enter the mainstream; in the words of one product

provider it is “the new normal. The essential difference between ESG and impact investing comes down to intention; social impact investing specifically targets companies and organisations that intentionally create a positive social benefit.”.

The advisory group estimate that the UK impact investing market, including both social and environmental impact, is currently worth £150 billion, based on a definition specifying that investments are made with the intention of creating a positive outcome, including in renewable infrastructure, social housing, social businesses and green bonds

Page 21 Impact investing taxonomy

When considering impact investment, returns can work in essentially three ways:

Investments where environmental returns are directly linked to revenue.

Investments where social impact can be increased without much or any effect on financial returns.

Investments where the social return requires some sacrifice of financial return.

Page 24 The current state of play within the UK Government and devolved administrations

Lessons from clean energy policy

At the nascent stage of their evolution renewable technologies needed government support and government facilitation, through targets, regulatory frameworks and direct subsidies, to develop within an energy market characterised by mature, centralised technologies. Renewable systems are different from those technologies. They are often decentralised, have high capital but minimal running costs and they generate differently. They need different connector and transmission infrastructure and generally have larger footprints (i.e. solar/wind farms). Government support was crucial to developing renewable sources of energy and bringing them to the stage where they can compete commercially with fossil fuel technologies.

This support created investor and private sector confidence and an increasingly commercially viable market is now emerging. For example, between 2015 and 2016 - the cost of onshore wind power fell from over $110 per megawatt hour (mWh) a year ago to $85 as they become more efficient and cheaper to build. Over the same period, coal-fired power stations have seen their costs rise from nearly $98 mWh to $115 and gas from $100 to $114, after the EU agreed new rules that will start to internalise their environmental costs by increasing the amount they must pay for their carbon emissions.

The same trend, of sharply declining generation prices is now observable with offshore wind. Competition, investment, innovation, and scale all contribute to the rapid cost declines that have been achieved throughout the industry’s supply chain—from turbine manufacturing to installation to power transmission.

Lessons from social impact investing policy

The UK has been a pioneer in social impact investing. The Treasury first established a taskforce to investigate how entrepreneurship could be applied to combine financial and social returns in 2000. The UK again took the initiative in 2012 and 2013, launching Big Society Capital, a wholesale social investment institution, to grow the market and then establishing a Social

Impact Taskforce and National Advisory Board during its presidency of the G8, helping take the idea global. Social impact investment frames a social or economic problem as a matter of financial efficiency, putting a price tag on development challenges such as unemployment or public administration efficiency. The financial gains that would result from addressing the problem are presented as an investment opportunity for the private sector, guaranteed and repaid with a premium by the government with potential support from donors.

Text adapted from the Social impact investing taskforce report (2014). See:

http://www.socialimpactinvestment.org/reports/Impact%20Investment%20Report%20FINAL[3].pdf

A changing public sector landscape — the Localism Act (November 2011), the Public Services Social Value Act (March 2012) and the Open Public Services white paper (July 2011) all lean towards the public sector operating much more as a commissioner, not a provider of services, encouraging a greater diversity of potential providers into a range of social and environmental services

Page 28 Summary of key findings

Is finance supply or demand constrained ?

Oliver Wyman evidence illustrates the lack of investable project. The Development Bank of Singapore (DBS) estimates that annual demand of US$200 billion in Southeast Asia over the next 30 years will massively outstrip annual supply of S$40 billion. However, polling at the November 2017 G20 Green Finance Conference in Singapore indicated otherwise. During the conference, the audience – composed of finance professionals in the green space – responded to a live polling question: "What is the biggest challenge to scaling up financing for green projects?" Almost half (44 percent) answered "lack of environmental data," while 39 percent selected "lack of investible projects", and the remaining 17 percent chose "inconsistent standards." Neither "investor demand" nor "maturity mismatch" were picked. This phenomenon points to a paradox at the core of green finance: Top-down estimates suggest a huge need without being matched by sufficient bottom-up funding. Yet when investors were asked the same question, they focused on matters of data, project invisibility, or standards – clearly indicating that the issue for investors is a shortage of demand, rather than supply!

Specific versus general needs

As with social impact investing, there is a need for a specific and general definition for nature conservation. For social investing, the general definition refers to any investment which might have a positive social outcome. The specific definition refers to investments in enterprises with a clear social remit. This is the same for nature conservation. This needs general investment which reduce the drivers of biodiversity loss, like investment in sustainable food production or pollution control but also specific investment in the measures which actually help achieve the UKs biodiversity targets.

Financial risk and environmental uncertainty

Risk, the consequence of an event combined with the likelihood of its occurrence, is a prominent issue for investors and conservationists alike. In finance, investment analysis incorporates techniques to evaluate a variety of risks, such as market, credit, liquidity and operational risk. Conservation organizations face similar risk issues but also face additional operational uncertainties which can compromise environmental impact.

How long term factors around climate change and environment degradation should be considered in relation to systemic financial risks is beginning to be addressed. Talking about climate change, Michael Bloomberg and Bank of England Governor, Mark Carney noted “The challenge is that investors currently don’t have the information to respond to these developments.” “This must change if financial markets are going to do what they do best: allocate capital to manage risks and seize new opportunities. Without the necessary information, market adjustments to climate change will be incomplete, late and potentially destabilising.” Such considerations apply equally well to environmental degradation.

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