

Tread lightly

**Biodiversity and ecosystem services
risk and opportunity management
within the extractive industry**

October 2011

About the Natural Value Initiative (NVI)

<http://www.fauna-flora.org/initiatives/nvi/>

The NVI is a collaboration between Fauna & Flora International, the United Nations Environment Programme Finance Initiative (UNEP FI), Nyenrode Business University, the Dutch Association of Investors for Sustainable Development (VBDO). It has four broad objectives, to:

- Build awareness of corporate dependence on ecosystem services and impact on biodiversity and the links to corporate risk;
- Build expertise both in companies and investors on evaluating and managing biodiversity and ecosystem services (BES) risks and opportunities;
- Stimulate improved performance within the private sector and encourage greater reward of responsible behaviour;
- Mainstream biodiversity and ecosystem services into investment analysis.



Fauna & Flora International <http://www.fauna-flora.org>

Fauna & Flora International (FFI) is the world's first established international conservation body, founded in 1903. FFI acts to conserve threatened species and ecosystems worldwide, choosing solutions that are sustainable, are based on sound science and take account of human needs. Through its Global Corporate Partnership Programme, FFI aspires to create an environment where business has a long-term positive impact on biodiversity conservation. FFI leads the Natural Value Initiative collaboration.



VBDO <http://www.vbdo.nl/>

The VBDO formulates strong opinions on different topics related to sustainability, and regularly carries out research, visits Annual General Meetings of stock listed companies and engages in an active dialogue with banks, insurance companies, media and stock listed companies. As such VBDO is the only association in the Netherlands representing institutional as well as individual sustainable investors.



Nyenrode Business Universiteit <http://www.nyenrode.nl/cfs>

The Center for Sustainability of Nyenrode Business Universiteit is a multidisciplinary team of academic professionals that focuses on:

- Adding sustainable value for our clients and our society, by means of;
- Conducting practice-related scientific research, to;
- Stimulate sustainable development and innovation in business and society; and
- Offering leading higher education on sustainable development.



United Nations Environment Programme Finance Initiative (UNEP FI)

<http://www.unepfi.org>

The United Nations Environment Programme (UNEP) Finance Initiative is a strategic public private partnership between the UNEP and the global financial sector. UNEP FI works with over 200 financial institutions that are signatories to the UNEP FI Statements, and a range of partner organisations to develop and promote linkages between the environment, sustainability and financial performance.

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Declaration

Fauna & Flora International accepts funding from Anglo American, BHP Billiton, Rio Tinto, Eni exploration and production division and Holcim. It has a link to Lafarge through membership of Lafarge's biodiversity advisory panel. In order to ensure impartiality was maintained in the analysis, reviews of these companies were conducted by individuals with no link to these organisations, and reviewed by VBDO.

Acronym	Definition
BAP	Biodiversity Action Plan
BBOP	Business and Biodiversity Offsets Programme
BES	Biodiversity and Ecosystem Services
CBD	Convention on Biological Diversity
EBI	The Energy and Biodiversity Initiative
EMS	Environmental Management System
ESB	Ecosystem Services Benchmark (a tool produced by the Natural Value Initiative)
ESIA	Environmental and Social Impact Assessment
ESR	The Corporate Ecosystem Services Review
EU	European Union
FFD	Forest Footprint Disclosure Project
FFI	Fauna & Flora International
GEMI	Global Environmental Management Initiative
GHG	Greenhouse Gases
HCVF	High Conservation Value Forests
IBAT	Integrated Biodiversity Assessment Tool
ICMM	International Council on Mining & Metals
IFC	International Finance Corporation
IPIECA	International Petroleum Industry Environmental Conservation Association
IUCN	The World Conservation Union
MA	Millennium Ecosystem Assessment
MDG	Millennium Development Goals
NBSAPS	National Biodiversity Strategies and Action Plans
NGO	Non-governmental Organisation
NVI	Natural Value Initiative
PES	Payment for Ecosystem Services
SSSI	Site of Special Scientific Interest
TEEB	The Economics of Ecosystems and Biodiversity
UNEP FI	United Nations Environment Programme Finance Initiative
UNEP-WCMC	United Nations Environment Programme World Conservation Monitoring Centre.
VBDO	Vereniging van Beleggers voor Duurzame Ontwikkeling
VROM	Dutch Ministry of Housing, Spatial Planning and the Environment
WBCSD	The World Business Council for Sustainable Development
WEF	World Economic Forum
WRI	World Resources Institute

Foreword

The loss of biodiversity and ecosystem services is, alongside climate change, one of the biggest environmental issues of our time. The last two years has seen significant movement on the issue of biodiversity and ecosystem services. The Conference of the Parties of the Convention on Biological Diversity approved a Biodiversity strategy for the next ten years in 2010 which stresses the need to appropriately value biodiversity and ecosystem services as essential part of environmental quality and to include that value in business decision making. The new EU biodiversity strategy underlines the central role that the private sector should play in maintaining and safeguarding our natural asset base. Within the framework of its Biodiversity Policy, the Dutch government endorses this role, and is committed to facilitating the private sector in doing so.



The extractive industry, whilst providing essential goods and services to our society, can both impact on and is dependent on biodiversity and ecosystem services. Companies that are proactively managing and reducing their impact on biodiversity can deliver real benefits for the environment. Those that are not can cause significant damage. We are glad that the Natural Value Initiative is turning their attention to this important sector and it is good to see that a number of Dutch investors are engaging in this work. This is one step closer to ensuring that both the extractive industry, as well as investors, preserves our natural capital.

Joop Atsma, State Secretary of Infrastructure and the Environment, The Netherlands



I am really encouraged to see work like this emerging. We all need to understand better how we depend upon biodiversity and ecosystems for our economic prosperity and personal well-being. Leading businesses clearly have a tremendously important role to play as we build a sustainable future through our transition to a green economy. Our recently published Natural Environment White Paper clearly outlines our vision for the natural environment over the next 50 years and the important role of business in achieving this vision.

Richard Benyon MP, Parliamentary Under Secretary for Natural Environment and Fisheries, Department for Environment, Food and Rural Affairs, UK Government



Fauna & Flora International took a strategic decision some twenty years ago to engage directly and constructively with the private sector as a means of delivering on our objectives to conserve species and habitats worldwide in a way that goes hand in hand with meeting human needs. We have seen the extractive industry take great strides in its consideration of biodiversity. We are at a point of evolution. Society, governments and the private sector are realising that the services from the natural world are undervalued, underpriced and finite. Biodiversity conservation is no longer the preserve of the philanthropists; it is vital for sustainable development. We are proud to be working with a number of the companies featured in this report for their proactive approach on this issue. However, there is always more to be done.

Mark Rose, Chief Executive Officer, Fauna & Flora International

Investors increasingly grasp that the 21st century will be shaped by resource scarcity compounded by climate change, and that leading companies will protect and even enhance healthy ecosystems where they operate or source goods. As a result, investor understanding of biodiversity is shifting; where biodiversity loss was once seen only as a distant risk to corporate reputation, many investors now realise that a company's social licence to operate may rest on good stewardship and stakeholder engagement.



Given the overlap of key areas of natural capital and extractives operations, investors need sound analytical tools for understanding corporate risk from biodiversity loss, as well as how to value ecosystem stewardship. The Natural Value Initiative's Ecosystem Services Benchmark (ESB) provides a starting point for investors in extractives; enabling investors to explore how to include biodiversity data within financial models and discuss biodiversity risk and mitigation with these companies. As a company specialised in sustainable and responsible investment management, Calvert is pleased to be part of the benchmarking tool development, and will apply these data to company analysis and dialogues.

Barbara Krumsiek, President, Chief Executive Officer and Chair of Calvert Investments, Inc

Biodiversity and ecosystems provide the basic conditions for the existence of humans. Ecosystems provide humans with the necessities of food, medicines, wood, water and energy, and are important for cultural and recreational reasons. Many companies are dependent on biodiversity and ecosystems and in some cases damage or improve the ecosystems without being aware of their impact.

Impact on biodiversity and ecosystems is related to questions such as access to mineral reserves, and the stability of the offering of natural products. Particularly within the extractive industries, damage to biodiversity may have material consequences, not just to society but also to business performance.



Mismanagement of biodiversity risks are therefore also an investment risk. As an investor, Mn Services is often faced with a lack of awareness within companies of the biodiversity risks they face. We believe that it is important that companies in the extractive sector are aware of the risks and challenges that they are facing relating to this issue. The Ecosystem Services Benchmark (ESB) is a helpful tool in evaluating companies to understand and manage risks and opportunities in their impact and their dependency on ecosystems. It will help us push this topic higher up the agenda of companies in the extractive sector such that it is part of any corporate social responsibility policy in the near future.

Kris Douma, Head of Responsible Investment & Active Ownership, Mn Services

Biodiversity is a complex subject for most companies. As the avant-garde now seems to realise, biodiversity is as much a common denominator for all environmental aspects as human rights are for the social elements. There is a need to foster better understanding of this within the private sector and amongst investors. The plan of action should be threefold: coming up with a clear-cut business case, understanding how to act to conserve biodiversity and finding indicators to measure the effects of those actions and the extent of our progress. This is by no means an easy task. It is probing into unknown territory. Many costs are not yet quantified, nor are they incorporated in the cost-price of a product. This represents a key barrier to private sector movement on this issue.



In order to be fit for the future, companies need to understand the nature of their impact on our planet and its living occupants. For investors who want to make sound and long-term returns, this understanding is as vital as for companies. In my experience, companies appreciate the active engagement of investors who take their responsibility as 'co-owners' of a company seriously, together with that of other engagement groups like civil society. After all, by gaining a better understanding of their impacts and acting responsibly to manage them, companies can assure sustainable development and our long-term survival. It is up to the investors to stimulate this sustainable pattern of behaviour.

Giuseppe van der Helm, Executive Director, VBDO



Biodiversity and ecosystem services have already begun to affect value, albeit in ways that most investors do not necessarily recognise as such—more familiar are terms like “escalating environmental remediation costs”, “tight water supplies” or “the end of easy oil”. But what is still missing is a set of tools that goes one step beyond framing good operational practices, and enables companies and their investors to impute an economic value to BES value held, added or lost. This report is a key step forward on the path to bringing such a valuation tool into being, by establishing a common understanding of good practice and how to measure it. Our aim as major investors in the extractives sector is to identify the premium or discount implicit in a particular company’s asset mix and management practices, and in so doing to gain a better grasp of its financial value and earnings potential.

Karina Litvack, Head of Governance and Sustainable Investment, F&C Investments



Over the past years, the Natural Value Initiative has filled an important gap, to develop a qualitative benchmark that both investors and companies in sensitive industries such as agribusiness, pharmacy and extractives can use to better understand how to mitigate risks related to impacts and dependency on biodiversity and ecosystem services. UNEP FI has been there from the start, and supports this important initiative wholeheartedly.

Although many companies in the extractive industry have already taken considerable steps to identify, manage and reduce impacts on biodiversity and ecosystem services, we hope this study will further stimulate this process. We will engage investors that are members of UNEP FI to use the findings of this study to stimulate them to integrate it into investment decision-making.

Paul Clements-Hunt, Head of Unit, UNEP FI

Executive Summary

In the last two years alone, we have seen investor action linked to the biodiversity impacts Anglo American's Pebble mine in Alaska¹, a high profile campaign waged by Greenpeace against Cairn Energy's proposed activities in Greenland² and the withdrawal of investments in Barrick Gold, Freeport McMoRan and Rio Tinto³. Although multiple factors were at play in these incidents, biodiversity and ecosystem services or BES (see box 1) were fundamental issues in all of these exposures.

The loss of biodiversity and ecosystem services impacts on society's ability—and that of business—to respond to future challenges of water and resource scarcity and climate change. As we move towards an increasingly resource and carbon constrained world, both the oil and gas and mining sectors are likely to experience reputational, operational, regulatory and financial risks associated with the decline of BES. Such risks are increasing as a result of: greater demand for resources; extraction of mineral reserves in remote locations; companies operating at the edge of current technologies in challenging operating environments and changing investor and societal appetite for risk. The extractive industry provides products that are essential to society. Such companies must be able to recognise that they depend on BES and operate within societal expectations of environmental and social performance. This is becoming increasingly fundamental to gaining access to resources and to continued business growth.

Box 1: Defining biodiversity and ecosystem services

Biodiversity is the variability among living organisms, including diversity within species, between species and of ecosystems.

Ecosystem services are the benefits that people receive from ecosystems and can be divided into four broad areas:

- **Provisioning services:** Goods or products obtained from ecosystems such as food, freshwater, timber and fibre;
- **Regulating services:** Benefits obtained from natural processes such as climate, disease, erosion, water flows and pollination, as well as protection from natural hazards;
- **Cultural services:** Non-material benefits obtained from ecosystems, such as recreation, spiritual values and aesthetic enjoyment (elements of biodiversity are included within this e.g. charismatic species);
- **Supporting services:** Functions that maintain all other services, such as photosynthesis, water and nutrient cycling.

Biodiversity underpins healthy ecosystem services.

Source: Hanson, C. et al., 2009



Paul Hobson/naturepl.com

Benchmarking BES management in the extractive industry

In this report, the Natural Value Initiative (NVI) reviews 30 companies in the mining and oil and gas sectors with total market capitalisation of £1,638 billion (US\$ 2,545 billion, Euro 1,900 billion). The study was conducted on behalf of the following investors: UK-based asset managers Aviva Investors and F&C Investments, US-based asset managers Calvert Investments and Pax World, Dutch investors Mn Services, Robeco and Syntrus Achmea, an Australian pension fund, VicSuper, and in collaboration with a Swedish advisor to institutional investors, Ethix SRI Advisors. Collectively, these represent £787 billion (approximately Euro 913 billion, US\$ 1,223 billion) of assets under management⁴.

The survey supports and extends one conducted by Insight Investment and Fauna & Flora International in 2005⁵. It evaluates progress made by the sectors in addressing the issue of biodiversity, responding to emerging thinking on ecosystem services and developing robust systems to manage risk and realise opportunity associated with these issues. The report outlines company responses, identifies strengths and areas of common weakness, makes recommendations for improvement and offers further actions for investors, government and the industry. It is these suggestions for improvement that the investors involved in this study are using in their ongoing dialogue with companies identified as underperforming within the analysis.

Approach

The Ecosystem Services Benchmark (ESB) is based on a benchmarking methodology that was originally developed by the UK-based asset manager Insight Investment and Fauna & Flora International for the oil and gas⁶, mining and utilities sectors. This methodology was updated and adjusted to reflect the increasing maturity of thinking on this issue and the recent developments in tools and approaches for understanding and managing impacts and dependence on ecosystem services. Its focus is on corporate impacts on biodiversity and the extent to which companies consider the role of ecosystem services management in water management and climate adaptation and mitigation. The ESB considers five interdependent categories of performance: competitive advantage, governance, policy and strategy, management and implementation, and reporting. These categories are weighted to reflect the relative importance of each element. The different categories are weighted as follows: competitive advantage (15%), management and implementation (25%), reporting (20%), policy and strategy (20%), and governance (20%). Different levels of performance are assigned ranging from one (poor performance) to four (best practice).

The analysis was conducted from January 2010 to July 2011 and was based on publicly available information. The companies included in the analysis were selected by the investors listed above on the basis of their assets under management. Each company was invited to discuss the results to ensure that these were an accurate reflection of its activities and to supplement information in the public domain with internal information. Of the 30 companies, 19 (69%) responded to this invitation. Lack of response from companies is interpreted as a reflection of 'questionnaire fatigue' and a lack of perceived materiality of the issue.

Results

The table below divides the 30 companies that were evaluated in accordance with their performance against the Ecosystem Services Benchmark.

Company performance

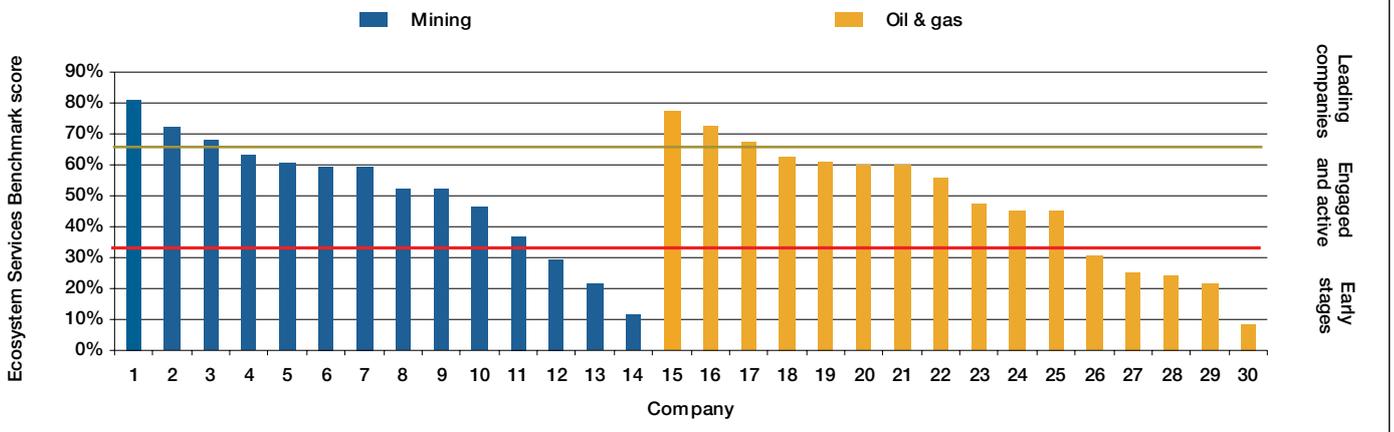
Table 1: Benchmark results (presented in alphabetical order)

	Mining	Oil & Gas
Leading companies: Risk and opportunity formally assessed, comprehensive integration of BES into policy and management systems	Anglo American plc (AAL)*^ Rio Tinto plc (RIO)*^ Xstrata plc (XTA)^	BG Group plc (BG)*^ Eni Spa (ENI)*^ Royal Dutch Shell plc (RDSB)*^
Companies engaged and actively managing BES: Awareness demonstrated through acknowledgement of company's impact on biodiversity, its inclusion within certain aspects of risk management and/or some reference within policy documents and/or management tools	Barrick Gold Corporation (ABX) BHP Billiton Ltd (BHP)*^ Freeport-McMoRan Copper & Gold Incorporated (FCX)* Cemex SAB de CV (CEMEXCPO)^ Holcim Ltd (HOLN)*^ Lafarge S.A. (LG)*^ Lonmin plc (LMI)^ Vedanta Resources (VED)*^	BP plc (BP)*^ Cairn Energy (CNE)^ Encana Corporation (ECA)* ExxonMobil Corporation (XOM)* Neste Oil OYJ (NES1V)*# Petrobras (PETR4) Sasol Ltd (SOL)+ * Statoil ASA (STL)*^
Companies in early stages of BES management: Risk evaluation in early stages of development, activity to manage impact and dependence limited	Amg Advanced Metallurgical Group N.V. (AMG) ArcelorMittal (MT)*+ First Quantum Minerals Ltd (FM)	Gazprom Neft (SBN) Lukoil (LKOH) PT Perusahaan Gas Negara Persero Terbuka (PGAS)*# SBM Offshore N.V. (SBMO)# Tullow Oil plc (TLW)^

* Companies that engaged with the NVI to confirm the accuracy of our analysis
 + Mining represents a small but growing part of the company's operations, BES management practices are evolving
 # These companies have a lower risk exposure to BES than the other companies included in the analysis. Management activities on BES appear appropriate for the level of risk exposure
 ^ Companies reviewed in the 2005 Insight Investment and Fauna & Flora International benchmark Companies highlighted in bold type had the highest benchmark scores for their respective sectors

It should be recognised that there is a range of sophistication of BES management within each of the three groupings of companies (see Figure 1). Those companies identified as in the early stages of BES management pose a greater risk to investors. The ESB measures the maturity of the company's management systems on biodiversity. It does not measure the extent to which the company is exposed to risk. PT Perusahaan Gas Negara Persero Terbuka and SBM Offshore, for example, provide pipelines and services to the oil and gas sector respectively and Neste Oil refines oils. As a result, their biodiversity risk exposure is very different to that of the major oil and gas producers.

Figure 1: The extent of sophistication of BES management systems varies considerably across the companies surveyed



Of those companies surveyed, BES was considered a significant issue for 27 of the 30 companies reviewed based on the nature and location of the companies' operations. The results from reviewing those 27 companies are summarised below.

Key findings

Table 2: BES management in the extractive sector: key trends and figures

Criteria	Proportion and (number) of companies			
	Mining		Oil & gas (n=13)	
	2005 n=13	2011 n=14	2005	2011
Policy commitment on biodiversity	85% (11)	79% (11)	92% (12)	84% (11)
Detailed policy commitment on biodiversity	23% (3)	43% (6)	15% (2)	46% (6)
Biodiversity risk assessments undertaken for all sites	0% (0)	21% (3)	23% (3)	31% (4)
Activities underway to manage biodiversity	92% (12)	93% (13)	92% (12)	100% (13)
Action plans at all high risk sites (in terms of biodiversity)	0% (0)	14% (2)	8% (1)	21% (3)
Quantitative metrics reported for biodiversity	0% (0)	29% (4)	0% (0)	0% (0)
Targets in place for biodiversity management	15% (2)	57% (8)	15% (2)	54% (7)
Piloting ecosystem services tools	-	29% (4)	-	38% (5)
Exploring ecosystem services markets	-	38% (5)	-	38% (5)

Limitations of the analysis

In the absence of widely agreed performance metrics for BES, this analysis is heavily reliant on process-based measures of management quality as a proxy for performance on the ground. Due to resource constraints, the methodology used did not undergo extensive stakeholder consultation, nor were the results subject to audit. The results of those companies that engaged in the process will be higher than those that did not, as the information required for completion of the analysis was frequently not available in the public domain. In some instances, cultural variations and language issues may have adversely impacted on a company's performance. These results should be viewed with this in mind.



Juan Pablo Moreiras/FFI

Conclusions

Both the mining and oil and gas sectors have matured in their approach to BES:

Since the Insight Investment Benchmark of 2005, more companies have detailed policy commitments on BES, risk assessments are more sophisticated and more extensive and piloting of emerging methodologies on ecosystem services is underway.

BES was perceived by 80% of the companies surveyed as a material issue:

Perceived materiality was assessed based on companies making specific reference to BES in publicly disclosed policy and strategy documents, or standards. Significantly more companies (20%) made detailed commitments on biodiversity in 2011 compared to the 2005 survey⁷, although overall the degree of high level policy commitments was slightly lower. This reflected the differences in the sample of companies used in 2005 compared to 2011.

More companies are committing to causing 'no net loss' of biodiversity:

In 2004 Rio Tinto made an ambitious commitment to 'have a net positive impact'. Rio Tinto remains the only company to have made such an ambitious commitment, however, two companies commit to causing "no net loss" of biodiversity and a number of companies are exploring the potential for making a similar commitment. The benefits of such a commitment have not yet been quantified. However, those companies making such commitments feel that they confer competitive advantage.

Realisation of the linkages between the management of biodiversity, climate and water is growing:

Efforts to integrate BES into broader environmental management (water management, climate adaptation, biofuels sourcing) are still in their infancy. A number of companies (in particular Rio Tinto, Anglo American, ExxonMobil, BP, Shell and Eni) are beginning to adopt an integrated approach with BES being specifically addressed as a line item/component within water management and climate mitigation and adaptation policies and strategies. These companies have also undertaken pilot projects to explore the use of ecosystem services restoration for, for example, coastal protection initiatives or reduction of water filtration costs. However, often it was not clear how systematically ecosystem services considerations were integrated into water and climate management.

Approaches to corporate level biodiversity risk evaluation appear to be maturing:

Over 90% (25) of the companies reviewed included biodiversity within their corporate risk management practices to some extent (based on public disclosures). Despite widespread activity on the issue, only five out of the 27 companies surveyed reported activity to manage biodiversity at all high-risk sites.

It is challenging to determine how well risks are managed at a corporate level:

Few companies disclosed the processes underlying their risk evaluations, for example, companies rarely defined what they meant by sites of 'high biodiversity value', hence the exact scope of such risk assessments and their utility for identifying all risks was not uniformly clear. Where transparent and comprehensive risk evaluations and assurance processes are lacking, it is challenging to determine whether the activities underway to manage BES are sufficient to manage the company's corporate level risk exposure. Incomplete evaluation of risk and implementation of risk management practices and an emerging understanding of ecosystem services exposes even the companies most advanced in their management of these issues to spills, liabilities and lawsuits.

Contributions to conservation are being made:

The majority of the companies had activities in place that aimed to contribute to biodiversity conservation, whether through developing projects to address impacts, one-off contributions to conservation via donations or through ongoing partnerships to build the capacity of conservation organisations.

Partnerships with NGOs are used to build capacity within the private sector:

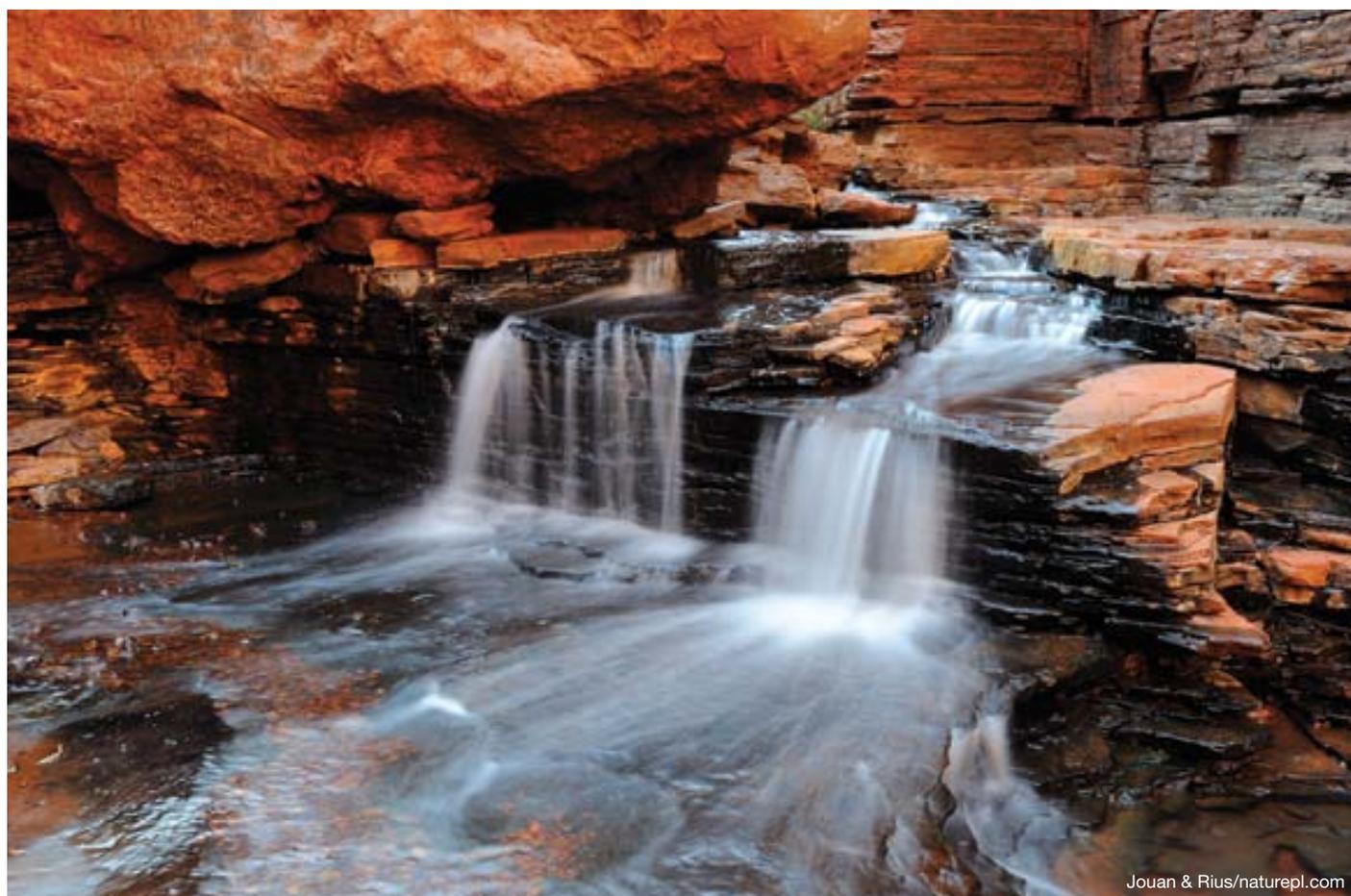
Of the 12 companies scoring the highest in the analysis, nine had (either current or historic) strategic, long-term, multi-project partnerships that inform corporate strategy and management of BES on the ground. This was a two-way process, with some NGOs seconding corporate staff to their own operations to build capacity in governance and organisational management, for example.

Current corporate reporting metrics provide limited insight into risk exposure:

Less than 50% of the companies reviewed reported extensively against BES related indicators. Reporting and performance metrics remain a key area of weakness throughout all companies due to a lack of appropriate, widely agreed BES performance indicators. This remains an inherently challenging area due to the complexities of measuring impact on, and monitoring change of, BES. Review of the data reported against the Global Reporting Initiative (GRI) indicators shows that the information reported as complying with GRI guidance is highly variable in nature. Sector specific indicators (such as those set out by the Cement Sustainability Initiative, the GRI Mining and Metals sector supplement the International Petroleum Industry Environmental Conservation Association (IPIECA) Guidance on Voluntary Sustainability Reporting) offer a good step towards a more quantified approach which will be beneficial for investors. However, more could be done to provide companies with guidance on the level of detail and nature of disclosures required to clearly communicate on their management of BES risks and opportunities.

Interest in environmental markets and tools to understand ecosystem services impact and dependence is growing:

Of the companies surveyed, just over a third were exploring the implications of the growing public policy interest in ecosystem services based markets. Interest is highest in wetland offsets and mitigation banking in the USA and reduction of emissions from deforestation and forest degradation (REDD) more broadly. Interest and engagement on the development of tools to understand and evaluate impacts and dependence on ecosystem services is high, particularly in the oil and gas sector.



Jouan & Rius/naturepl.com

Recommendations

The following recommendations are suggested based on the findings within this report:

For investors:

- **Work with companies, governments and environmental groups to identify appropriate measures of BES risk and performance for the extractive sector:** In doing so, investors will be better able to identify and monitor risk within their investment portfolios.
- **Account for BES risks and opportunities:** Establish clear policies and processes to account for BES risks and opportunities in equity and bond funds, integrating BES into broader environmental, social and governance (ESG) analysis.
- **Build capacity to engage on the issue with portfolio companies and corporate clients:** Work with extractive companies to identify and adhere to acceptable standards of performance set out within internal investment policies (see table 3 for guidance).
- **Identify areas of risk and opportunity within your investment portfolio using tools such as the Ecosystem Services Benchmark:** Risk factors to consider are 1) existence of an aggressive exploration policy with a high proportion of assets in countries or areas of high biodiversity/ low conservation capacity; 2) lack of knowledge of areas or issues that could be deemed sensitive or high risk throughout a company's operations; 3) failure to acknowledge potential reputational and litigation/regulatory risk associated with mismanagement of impacts on areas of important biodiversity and ecosystem services; 4) failure to implement audited action plans at site level for sites identified as high risk; and 5) failure to explore the implications of declining BES for business. Opportunities for building brand value and reducing costs may arise as a result of a proactive approach on points one to five above, exploration of emerging market mechanisms for ecosystem services and biodiversity conservation, testing of new tools and approaches and contribution to addressing sectoral level barriers to progressing corporate management of the issue.
- **Work with companies in your portfolio to decrease their risk profile:** Engage with high-risk companies within the sector, providing them with guidance as to what constitutes good performance.

For governments:

- **Ensure the extractive industry is fully integrated into National Biodiversity Strategies and Action Plans and national ecosystem services assessments:** Governments in countries that are rich in mineral reserves or in which a significant proportion of the industry is headquartered, should ensure that national biodiversity strategies and action plans and national ecosystem services assessments are defined and that the private sector is supporting those established plans.
- **Strengthen concession permitting processes:** Ensure the process for awarding permits and leases for oil and mineral rights is done in a manner that supports the country's commitments under the Convention on Biological Diversity. This should set out requirements for companies to avoid, minimise, mitigate and offset their impacts on ecologically sensitive sites.
- **Continue to explore means of reflecting the true value of BES in decision-making:** Fund further evaluations of extractive sector impacts and dependencies on BES as a part of national level ecosystem services assessment. The findings should be used to inform future policy setting and regulations.
- **Strengthen the incentives and ability for companies to report on BES:** Governments are encouraged to put in place a legal requirement for disclosure of material social and environmental issues, including BES. Such legislation

should provide detailed guidance on BES risk, defining when a BES risk becomes material. It should also set out recommendations on BES indicators, developed in conjunction with companies and investors. Although inherently challenging, this is essential to drive consistent and comparable disclosure of data in the sector.

For companies:

Companies should attempt, where feasible, to follow the recommendations outlined in table 3 which sets out a suggested best practice approach to understanding and managing this issue, based on practices observed in this sector and others.

Table 3: Best practice approach to BES management

	What do we mean?	Indications of Best Practice
Policy and strategy	Introduce company-wide policy and/or strategy commitments to understand and manage biodiversity and ecosystem services risks and opportunities	<ul style="list-style-type: none"> Board-approved publicly available policy on biodiversity (or reference to biodiversity in board-approved environment or sustainable development policy supported by more detailed policy guidance). This should commit to avoid, minimise and mitigate and offset impact where possible. Integration, or exploration of the potential for integration of BES into policies and strategies on water, climate (adaptation and mitigation) and (where applicable) biofuels production and sourcing. Group-level BES strategy that acts as a framework for implementing policy commitments developed, in conjunction with key stakeholders, and informed by local, regional and national priorities as appropriate, which include credible goals and measurable targets. Ensure equivalent standards of policies and strategies to those outlined above for joint ventures and third parties such as contractors.
Governance	Processes and resources are in place to undertake a formal risk and opportunity evaluation of impact and dependence on biodiversity and ecosystem services	<ul style="list-style-type: none"> Identify and periodically review the BES risks, impacts and opportunities for contributing to BES associated with all existing and proposed operations, using tools such as the Integrated Biodiversity Assessment Tool. This should also be informed by local, regional and national biodiversity priorities and goals identified in National Biodiversity Strategy and Action Plans, national ecosystem assessments and discussions with key stakeholders. Integrate consideration of BES risks and impacts into key decision-making processes and governance structures, particularly early exploration. Ensure that risk evaluations for water, climate and biofuels consider both impact on BES and dependence. Appropriate resources are assigned to managing the issue.
Management and implementation	Tools, training and assurance processes are in place to drive improvement through the company and its suppliers in accordance with policy and strategy commitments	<ul style="list-style-type: none"> Ensure consistency and transparency of integration of BES analysis into Environmental and Social Impact Assessments. Take action to avoid, minimise and mitigate BES risks, including in-kind compensation ('offsets') where appropriate, formalising these activities in audited biodiversity action plans or site management plans that include BES at all sites where there is a significant risk to biodiversity or opportunity to contribute to BES conservation. Develop partnerships with key stakeholders that contribute to BES conservation priorities and corporate strategy. Ensure closure and sale planning includes consideration of BES -related issues Ensure that water management plans consider the role of natural assets e.g. maintenance of natural vegetation in controlling water run-off. Ensure that site climate mitigation plans consider the role of land based carbon and that adaptation plans consider the role of natural vegetation e.g. mangroves.
Reporting	Internal and external reporting processes, targets and indicators are in place for BES, allowing effective communication to stakeholders	<ul style="list-style-type: none"> Implement company-wide BES information collection and reporting systems with clearly defined target audiences, measure performance, set targets and disclose company performance, with a particular focus on high-risk locations and operations. Set out the location of these operations, including risks and activities to mitigate these. Use more quantified metrics of corporate risk as recommended by the GRI, IPIECA and Cement Sustainability Initiative e.g. percentage of high-risk sites with biodiversity action plans in place. Collaborate with regulators and environmental groups to develop metrics for BES performance.
Competitive advantage	Value is created or protected through company activity across the whole operational life cycle to ensure sustainable use of biodiversity and ecosystem services e.g. cost-efficiencies, new products and new markets	<ul style="list-style-type: none"> Review and test emerging tools on ecosystem services impact analysis and valuation e.g. the Corporate Ecosystem Services Review and Ecosystem Valuation Initiative to build a more comprehensive understanding of the potential risks and opportunities associated with BES impacts and dependence. Explore or develop mechanisms for generating value and minimising operational cost linked to biodiversity and ecosystem services e.g. biodiversity offsets and REDD, ensuring that appropriate safeguards are in place. Review external BES threats which might compromise positive company performance, reputational gain and competitive advantage.

Next steps for the NVI

Each company that was evaluated against the Ecosystem Services Benchmark has received a summary of their results with specific recommendations for actions. These are being used by the collaborating investors listed on page 92 and 93, as part of their ongoing engagement process with the companies in which they have an interest. This engagement will encourage action on areas where risks are unmanaged and opportunities unrealised. In undertaking work on various sectors on BES management, it has become apparent that a more robust, quantified, business case for managing the issue is required together with a uniformly agreed means by which BES risk, and therefore materiality, can be measured and monitored. In the coming year the NVI will be focusing its attention on that, collaborating with a range of partners to do so.

Final comment

Despite the best efforts of governments, conservation groups and leading companies, BES is still declining. Research increasingly shows that managing natural assets and threats before they become costly is a means to curb risk exposure while increasing competitiveness. If profitability and social responsibility are to be sustained into the future, then so too must ecosystem services and biodiversity. Multi-sectoral partnerships between the extractive industry, environmental groups and government will be fundamental to addressing some of the significant gaps in the tools and metrics needed to deliver this.



Brandon Cole/naturepl.com

Part 1 Introduction

For further reading see:
PWC (2010) Biodiversity &
business risk

Biodiversity is being lost at unprecedented rates. Sixty percent of the ecosystem services on which we as a society rely are either degraded or in decline⁸. The drivers for this loss are either constant or increasing⁹. The profound economic implications of biodiversity loss and ecosystem degradation are becoming clear. A number of countries are evaluating the status of the ecosystem services on which they rely, both within their national boundaries and through trade. In doing this, they are determining the economic implications of ecosystem degradation for government, business and society as a whole. As the risks and economic impacts of declining BES to society become clear, governments are exploring different means of incentivising a reduction of impacts on ecosystem services, much of which is driven by the private sector and consumption.

As society places a greater value on BES, challenges will increase for companies in the extractive industry that are operating in locations of high biodiversity and important ecosystem services. Those companies that are able to demonstrate strong performance are likely to preferentially secure access to resources, maintain licence to operate, secure access to finances and retain talented employees.

Studies conducted by F&C in 2004¹⁰ and Insight Investment and Fauna & Flora International in 2005 indicated that a number of companies in the mining and oil and gas sector were proactively managing their impacts on BES. However, these activities, whilst widespread, were not always embedded within a comprehensive policy, strategy and risk framework. This made it challenging to determine the extent to which the sector was effective in managing its risk.

In this report, the NVI investigates 30 companies in the mining and oil and gas sectors to determine progress made by the sectors in addressing the issue of biodiversity, responding to emerging thinking on ecosystem services and developing robust systems to manage risk and realise opportunity associated with these issues.

Over the period 1st January 2011 – 30th July 2011, research was conducted into the management of biodiversity and ecosystem services issues using the Ecosystem Services Benchmark – a methodology based on one developed by Insight Investment and FFI. Companies were evaluated against five areas of performance: policy and strategy, governance, management and implementation, reporting and competitive advantage. See section 5 for the detailed approach and methodology.

This report sets out the results of the analysis. Section 2 outlines the impacts and dependence of the extractive sector on biodiversity. Section 3 highlights the risks and opportunities this poses to the extractive industry. Section 4 considers the implications of this for investors. The detailed results and company responses are presented in section 6. Section 7 identifies strengths and areas of common weakness. Section 8 makes recommendations for improvement and offers further actions for investors, government and the industry. Although targeted at the investment and extractive industries, this report also has value for governments and environmental organisations working with the extractive sector.

The results are being used by the following investors and their advisors to better understand the BES risks and opportunities in their investment portfolios / research: UK-based money managers Aviva Investors and F&C Investments, US-based money managers Calvert Investments, Inc and Pax World, Dutch investors Mn Services, Robeco and Syntrus Achmea, an Australian pension fund, VicSuper and a Swedish advisor to institutional investors, Ethix SRI Advisors. Collectively, these represent £787 billion (approximately Euro 913 billion, US\$ 1,223 billion) of assets under management¹¹.

“Investor understanding of biodiversity is shifting; where biodiversity loss was once seen only as a distant risk to corporate reputation, many investors now realize that a company’s social license to operate may rest on good stewardship and stakeholder engagement.”

**Barbara Krumsiek, President,
Chief Executive Officer and
Chair of Calvert Investments, Inc**

Part 2

Impacts and dependence on BES within the extractive sector

This section outlines the key impacts and dependencies of mining and oil and gas companies on BES and considers the links between key environmental issues such as climate change and water management and BES. Like all industries, the extractive industry both depends on and impacts biodiversity and ecosystem services. A company depends on an ecosystem service if that service is an input or if it enables, enhances, or influences environmental conditions required for successful corporate performance and if that input cannot be substituted. A company impacts an ecosystem service if the company affects the quantity or quality of the service¹².



Helen Nyul/FFI

The impacts and dependence on BES within the mining industry are outlined below.

2.1 The mining sector and BES

Figure 2: Impacts and dependence on BES in the mining industry

	Exploration Surveying and analysis of the location containing mineral reserves	Construction Construction of living areas, processing facilities, roads, waste services and the construction quarries	Operation Processing of raw materials into valuable resources to be stored, transported and sold	Closure Closure of operations and processing facilities, cleanup of waste products, rehabilitation of concessions and recycling of buildings and materials
Dependencies	<ul style="list-style-type: none"> • Timber and aggregates for camp and access road construction • Local food sources for exploration team provisioning • Possible impacts on fisheries due to disturbance and introduction of alien-invasive species 	<ul style="list-style-type: none"> • Use of local natural resources such as water, timber and aggregates for roads, housing and the construction of processing facilities • Use of local food sources for provisioning of employees • Water filtration services to provide clean water 	<ul style="list-style-type: none"> • Reliance on natural flood and erosion control of surrounding vegetation • Water used for raw material processing / hydropower • Timber/ biomass used for fuel supply • Rivers and soil required for waste disposal and assimilation • Reliance on food and water resources, e.g. local meat, fish, and drinking water 	<ul style="list-style-type: none"> • Aggregates used to replace, cover and aid in the rehabilitation of mine site, also used for the continued safety of access roads during deconstruction, e.g. water to keep dust levels low, grit or stones used for traction • Local species used for replacement of vegetation
Impacts	<ul style="list-style-type: none"> • Noise, dust and vibrations from movement and seismic surveying and blast exploration can harm local species • Introduction of alien-invasive species may impact on biodiversity • Potential benefits to biodiversity through exclusion of other impacts e.g. hunting • Pollution from spills • Sediment runoff 	<ul style="list-style-type: none"> • Terrain modification, fragmentation of species and habitats • Introduction of alien-invasive species • Damage to water resources and upstream water purification (forests, diversion of rivers, waste dams, etc.) • Exclusion zones may restrict access of local communities to resources (food/ medicine) or cultural/ spiritual places • Water and habitat pollution, species loss from secondary or cumulative impact (inward migration of populations via new roads) • Potential impacts on artisanal and commercial game suppliers through exclusion zones 	<ul style="list-style-type: none"> • Disposal and pollution (noise, dust, emissions and vibrations) • Waste and wastewater causing detrimental visual, physical, biological and chemical imbalances to local environment and peoples • Interference with natural water supplies downstream (surface and groundwater) • Reduction of regulating services for flood provision and water purification through habitat loss • Increased risk of erosion and landslides due to soil degradation in surrounding zones • Exclusion zones may restrict access of local communities to resources • Water and habitat pollution, species loss from tailings dam breaches or disposal/ heavy metal contamination • Habitat & species loss as a result of inward migration of people and industries 	<ul style="list-style-type: none"> • Degradation of absorptive capacity of rivers to absorb waste and reduction of access to ecosystem services by downstream users • Incorrect replacement of vegetation (possible invasive species) • Possibility of rehabilitating other areas not mined as part of biodiversity offset program e.g. as added conditionality to mining application • Potential benefit to biodiversity and ecosystem services through high quality remediation and restoration programmes • Impact on local market for resources demanded during operations • Persistent contaminants in groundwater and surface waters

Source: ICMM (2005) Good Practice Guidance for Mining and Biodiversity IPIECA (2011) Ecosystem services guidance: Biodiversity and ecosystem services guide and checklists, WRI (2011) Mine the Gap
Image: Juan Pablo Moreiras/FFI

The oil and gas industry shows a similar pattern of impact and dependence on BES to the mining sector, although marine exploration and extraction activities give rise to a different range of risks and issues.

2.2 The oil and gas sector and BES

Figure 3: Impacts and dependence on BES in the oil and gas industry

	Exploration Surveying and analysis of the location containing mineral reserves	Construction Construction of living areas, processing facilities, pipelines and waste services, roads	Operation Processing of raw materials into valuable resources to be stored, transported and sold	Decommissioning Closure of operations and processing facilities, cleanup of waste products, restoration of concessions and recycling of buildings
Dependencies	<ul style="list-style-type: none"> • Timber and aggregates for camp and access road construction • Local food sources for exploration team provisioning • Possible impacts on fisheries due to disturbance and alien-invasive species 	<ul style="list-style-type: none"> • Use of local natural resources such as water, timber and aggregates for roads, housing and the construction of processing facilities • Use of local food sources for provisioning of employees • Water filtration services to provide clean water 	<ul style="list-style-type: none"> • Reliance on natural flood and erosion control of surrounding vegetation • Water used for raw material processing (cooling, transport, chemical mixing and fire control) • Timber/ biomass used for fuel supply • Rivers and soil required for waste disposal and assimilation • Reliance on food and water resources 	<ul style="list-style-type: none"> • Aggregates required for site rehabilitation and remediation and for the continued safety of access roads during deconstruction • Local species used for replacement of vegetation.
Impacts	<ul style="list-style-type: none"> • Noise, dust and vibrations from movement and seismic surveying can harm local species • Exclusion zones may restrict access of local communities to resources (food/ medicine) or cultural/ spiritual places • Introduction of alien invasive species • Water and habitat pollution, species loss from spills/ pollution/ blow outs • Potential benefits to biodiversity through exclusion of other impacts e.g. fishing, hunting 	<ul style="list-style-type: none"> • Impact on local market for resources demanded during operations (e.g. fisheries for rigs, or other food providers on land) • Terrain modification, fragmentation of species and habitats • Introduction of alien-invasive species along pipelines and roads • Damage to water resources and upstream water purification (forests, diversion of rivers, waste dams, etc.) • Exclusion zones may restrict access of local communities to resources • Water and habitat pollution, species loss • Potential benefits to biodiversity through exclusion of other impacts 	<ul style="list-style-type: none"> • Industrial pollution, noise and disruption of natural water regimes can damage local species and habitats. • Reduction of regulating services for flood provision and water purification through habitat destruction • Exclusion zones may restrict access of local communities to resources • Potential benefits to biodiversity through exclusion of other impacts • Introduction of invasive species through ballast water • Habitat & species loss as a result of inward migration of people and industries 	<ul style="list-style-type: none"> • Release of built up toxic wastes (eg. storage tanks or ballast) into land, surface water or ocean habitats. • Vast amounts of waste to be cleaned and assimilated by rivers or ocean currents, which could destroy the quality of downstream ecosystem services used by local plants, animals and people • Incorrect replacement of vegetation (possible invasive species) • Potential to have a benefit to biodiversity and ecosystem services if development occurred in degraded land • Possible pollution of water supplies and impacts to fisheries

Source: IPIECA (2011) Ecosystem services guidance: Biodiversity and ecosystem services guide and checklists
Image: Philip Stephen/naturepl.com

Mismanagement of these impacts and dependencies can give rise to risks. Equally, proactive management can give rise to opportunities (see section 3).

2.3 Biofuels and BES

Some companies in the sector recently extended to include 'primary' biofuels, namely fuels from agricultural crops, feedstocks harvested for their sugar, starch and oil content, which can be converted using hydrolysis/fermentation. Driven by concerns about fossil fuel linked climate change, in a number of jurisdictions legal requirements have been set requiring the blending of fuel oil with biofuels as part of national commitments to reduce greenhouse gas emissions. Mandates for blending biofuels into vehicle fuels had been enacted in at least 36 states/provinces and 17 countries at the national level by 2006¹³.

For those oil companies purchasing or producing biofuels, the inclusion of agriculturally based products within the oil supply chain has changed the nature of the industry's impacts and dependence on BES. Primary biofuel crop yields and prices are linked to the status of ecosystem services such as:

- Water consumption for crop irrigation, chemical synthesis and processing;
- Soil quality required to ensure continued yields;
- Regulation of water flow to avoid floods and droughts;
- Natural pollination services provided by ecosystems for some biofuel crops (loss of pollination reduces crop yield);
- Nutrient cycling impacts both on-farm and off-farm;
- Genetic diversity to promote crop health and enable disease resistance;
- Intensive pest management regimes are causing new varieties of resistant super-weeds and super-pests, causing a vicious circle of escalating pesticide/herbicide use, with knock-on effects on pest predator populations.

Biofuel crop production could potentially impact on BES through:

- Land use changes resulting in loss, fragmentation and degradation of valuable habitats (e.g. grasslands, forests, wetlands, soil erosion and the release of greenhouse gas emissions);
- Possible displacement of indigenous communities and smallholders who are dependent on natural resources for their livelihoods, damage to cultural and spiritual sites;
- Interference with natural water supplies downstream (surface and groundwater, flood regulation) through overexploitation, loss of riparian zone vegetation or contamination with pesticides and fertilisers;
- Possibility of alien-invasive species being introduced, causing widespread damage to biodiversity.

Although frequently such impacts are not under the direct control of the oil companies purchasing biofuels from third parties, increasingly the expectation from governments and society is that the biofuel supply chain will be managed to minimise social and environmental impacts. For example, the European Union Renewable Energy Directive requires that fuels must "not be produced on land of high biodiversity or high carbon stocks (such as primary forests, high biodiversity grassland, and wetlands)"¹⁴.

Emerging legislation and new standards relevant to the production of biofuels such as the Principles and Criteria from the Roundtable on Sustainable Biofuels, the Roundtable on Responsible Soya, Bonsucro and the Roundtable on Sustainable Palm Oil¹⁵ offer the opportunity for clearer operating standards. However, during this interim period standards and processes for understanding and managing impacts and dependence on BES are still emerging. This poses a potential risk for companies required to use biofuels, whether they produce biofuels through joint ventures or source from third parties.

2.4 Relevance of BES to other corporate environmental impacts

The World Economic Forum linked biodiversity to a wide range of global risks including food security, water management, poverty alleviation and climate change.



Helen Nyul/FFI

2.4.1 Climate Change and Biodiversity

For further reading see:
FFI (2010) FFI briefing: why
biodiversity matters for carbon
storage

Biodiversity, and associated ecosystem services play an important role in climate change mitigation and adaptation. Continuing, accelerating loss of biodiversity—through deforestation and forest degradation that contain huge volumes of sequestered carbon—will compromise the long-term ability of ecosystems to regulate the climate, and may accelerate or amplify climate warming¹⁶. The resilience of ecosystems can be enhanced, and the risk of damage to human and natural ecosystems reduced, through the adoption of biodiversity based climate adaptation and mitigation strategies¹⁷.

Climate Change Mitigation and Biodiversity

Ecosystems' biological and biophysical processes play a key role in storing and sequestering carbon. The degradation of many ecosystems is significantly reducing their carbon storage and sequestration capacity. Highly fragmented habitats, for example, have been shown to be less effective in storing carbon¹⁸. This leads to increases in greenhouse gases emissions and further loss of biodiversity. A 2009 report by the Convention on Biological Diversity supported this, stating that “diverse forests are more biologically productive and provide larger and more reliable carbon stocks, especially in old-age stable forest systems...Hence, protecting and restoring biodiversity serves to maintain resilience in forests, in time and space, and their ongoing capacity to reliably sequester and store carbon”¹⁹. The Intergovernmental Panel on Climate Change concluded that land use change (including deforestation) was responsible for approximately 25% of annual anthropogenic greenhouse gas emissions in the 1990s²⁰. The vital role that conserving natural terrestrial (e.g. tropical forests and peatlands), freshwater and marine ecosystems and restoring degraded ecosystems play is now recognised within global climate policy. The Bali Action Plan and 2009 Copenhagen Accord highlighted the reduction of emissions from deforestation and forest degradation, or REDD as an important element in climate policy going forward. The 2010 Cancun Agreement committed countries to establishing a REDD mechanism.

In a recent survey by McKinsey, 30% of companies working in the energy sector were taking steps to improve or restore biodiversity through, for example, participating in forest carbon offset markets²¹. Extractive companies that manage their land to deliver benefits for biodiversity and to prevent the release of carbon emissions may be able to generate social, environmental and economic benefits in future.

Climate Change Adaptation and Biodiversity

It is now generally accepted that, regardless of greenhouse gas emissions reductions, the world's climate will change. The status of ecosystem services is predicted to play an important role in the ability to adapt to the changing climate. The Economics of Ecosystems and Biodiversity (TEEB) review highlighted the strong cost-benefit case for public investment in ecological infrastructure (especially restoring and conserving forests, mangroves, river basins, wetlands, etc.) to assist in adapting to climate change²². The Global Assessment Report of the United Nations International Strategy for Disaster Reduction²³, for example, identified the decline of ecosystems and the associated degradation of ecosystem services as one of the three main drivers of disaster risk. Examples of ecosystem-based adaptation, which integrates the use of biodiversity and ecosystem services into an overall climate adaptation strategy include:

- **Coastal defence through the maintenance and/or restoration of mangroves and other coastal wetlands to reduce coastal flooding and coastal erosion:** evidence from a Red Cross mangrove-planting project designed to protect coastal populations from storm surges (which are expected to increase in frequency under climate models) in Vietnam estimated economic benefits that were 52 times higher than costs²⁴.
- **Sustainable management of upland wetlands/floodplains for maintenance of water flow and quality:** between 48-68% of expected wetlands/floodplain losses expected up to 2030 under high climate change scenarios could be averted through adaptation measures (such as maintenance of riparian zones and forest cover). The economic benefits of these outweighed their costs²⁵.
- **Conservation and restoration of forests to stabilise land slopes and regulate water flows:** this can reduce flooding risk and prevent tailings dam breaches.

Many businesses are already confronting the costs of climate change through increased water scarcity, flooding and extreme weather events²⁶. Corporate resources have largely focused on technological solutions to reducing greenhouse gas (GHG) emissions (i.e. mitigation strategies) despite a growing acknowledgement of the importance of adapting to climate change impacts²⁷.

The implications of this for the extractive sector are twofold:

- Current commitments on biodiversity (action plans, compensation schemes etc.) may be placed at risk if the changing climate is not taken into account in their design and implementation; and
- Opportunities to reduce the costs of adapting to, or mitigating, climate change may be missed.

A business's competitiveness will be determined by its ability to find low cost options for adaptation to climate change as companies identify new market risks and opportunities, navigate changing regulatory landscapes, and face increasingly significant costs²⁸.



2.4.2 Water management and BES

The industrial sector requires water for almost all of its operations, accounting for 16% of global water withdrawals. This figure is expected to increase to 22% by 2030. In the major developing economies of India, China, South Africa and Brazil, large industrial users face the spiralling challenge of decreasing water resources and increasing demand²⁹.

Conservative estimates suggest that a 7% gap between demand for water and water availability could represent a doubling in water prices by 2030. Less conservative predictions are that prices could more than triple in areas facing gaps of 30-40%³⁰. This indicates that countries like South Africa not only face severe water shortages, but also that these shortages indicate a direct future cost to the extractive companies operating there³¹.

Water management has traditionally focused on controls on water extraction and ensuring the quality of discharge. As awareness of water scarcity grows, stakeholders and businesses are considering the needs of multiple users of water, including wildlife. A recent UN report highlighted the importance of conserving ecosystem services to ensuring continued access to water for human use³². Management of ecosystem services intersects with water management as follows:

- **Pollution control:** maintenance of buffer strips (riparian zones) of natural vegetation, or the employment of conservation tillage, can reduce the load of contaminants entering the water and reduce soil erosion.
- **Water quality:** natural hydrology, or the ability of specific aquatic organisms, can be used to reduce the impacts of pollution on aquatic ecosystems, or to reverse the adverse effects of these pollutants.
- **Habitat rehabilitation:** rehabilitation of aquatic ecosystems and related natural habitats (e.g. bank reconstruction, artificial wetlands) can preserve or restore a range of ecosystem functions such as water filtration and offer cost-effective alternatives to industrial water treatment plants³³.
- **Flood control:** through the absorptive capacity of wetlands.
- **Stormwater management:** through the flow-regulation and peakflow-attenuation abilities of wetlands and green infrastructure.
- **Aquifer recharge.**

Natural assets such as forest cover of wetlands are often omitted from water management and water cost curve calculations. Yet, in some instances the conservation of well-managed natural assets can be more cost-effective than technical solutions to water management³⁴. Investment in green infrastructure to ensure water quality in the water supply for New York City, for example, saved up to US\$ 9 billion in management costs compared to human-engineered solutions³⁵.

Interest is growing in the use of economic instruments (incentives, penalties, user fees, licences etc.) to compensate or 'pay' for excessive use or degradation of water by the private sector. In 2010, 288 payments for watershed services and water quality trading programmes were identified across the world, compared to 126 programmes in 2008. Although schemes in Latin America dominated, they were also emerging in Europe, Asia, Africa and North America. The Ecosystem Marketplace calculated the transaction value of active water markets to be in the region of US\$ 9.3 billion, an increase of almost US\$ 4 billion on the previous year³⁶.

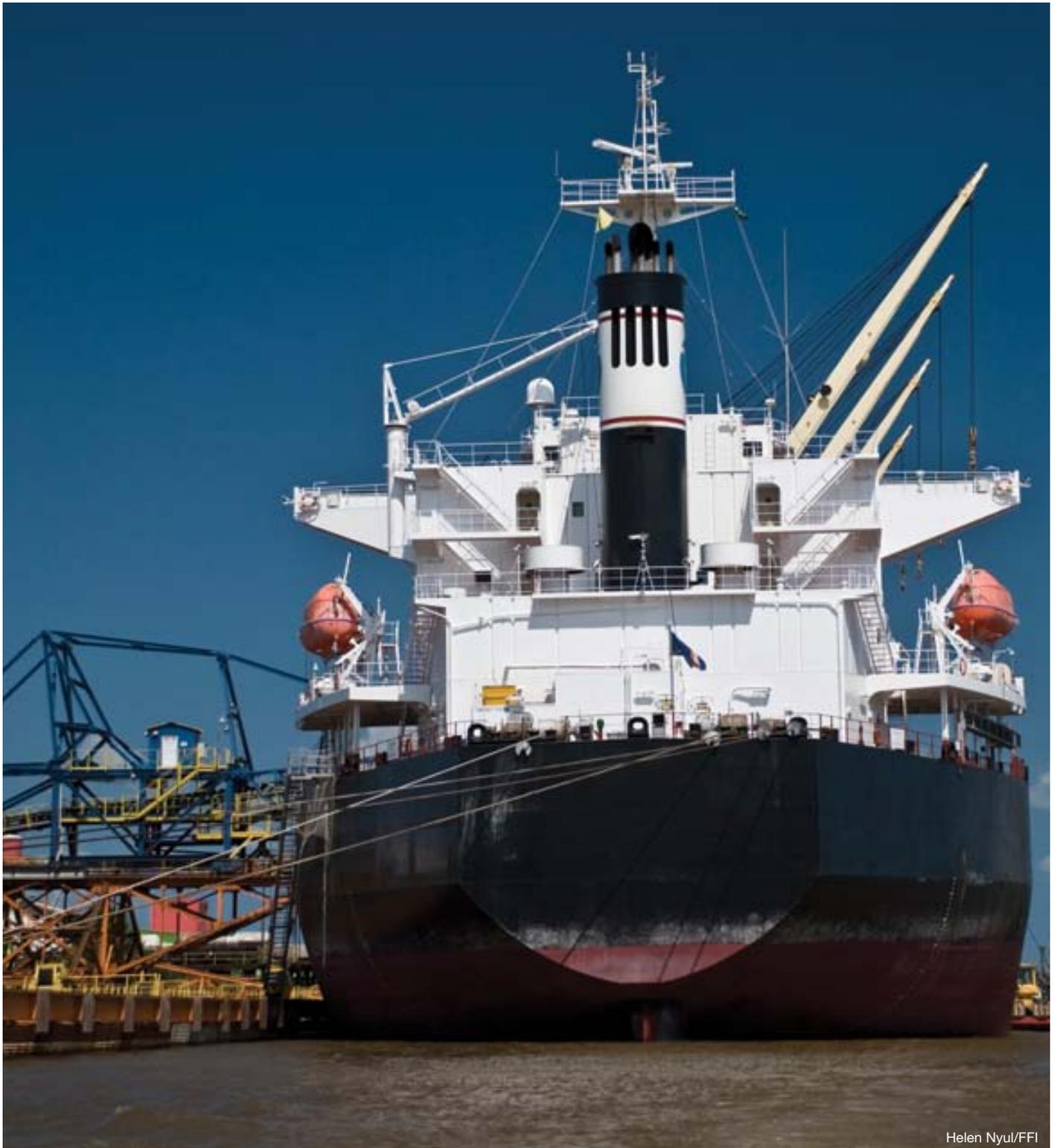
The World Resources Institute highlighted a range of trends (declining ore quality, predominance of mining operations in water constrained countries and rising global demand for metals) that will lead to water scarcity increasing in importance as an issue for the mining sector³⁷. It will be important that all options for managing water quality and scarcity are explored in the future to ensure that operating margins are maintained.

Part 3

Business implications of biodiversity and ecosystem services for the extractive sector

This section sets out the key risks and opportunities that declining BES pose for the extractive sector.

The last three years have seen the issue of biodiversity and ecosystem services rise rapidly up the corporate agenda. A review of global risks by the World Economic Forum showed the perception of biodiversity as a risk leaping upwards in terms of its perceived likelihood of occurrence and impact. Their survey placed biodiversity as an issue on a par with food security and terrorism³⁸. A survey of 1,000 companies by McKinsey in 2010³⁹ showed that biodiversity held a similar place in the public debate as climate change did in 2007. Recognition is growing that consumers and industry are not paying the full cost of the services they derive from the natural world. Furthermore, estimates have surfaced that the cost of environmental damage caused by the world's 3,000 largest publicly listed companies is in the region of US\$ 2.5 trillion annually⁴⁰.



Helen Nyul/FFI

3.1 Risks and opportunities associated with BES

This loss of biodiversity and ecosystem services has significant implications for all companies and may pose reputational, operational, regulatory, financing and market risks for the extractive sector. In particular, failing to manage BES may threaten the company's 'licence to operate', making it harder for companies to win new business from host governments in an increasingly competitive environment. This has obvious implications for shareholder value. Table 4 summarises the key risks to which companies are exposed and highlights some of the opportunities that are arising through proactive management of BES.

A number of opportunities are also emerging:

- **Cost reduction:** use of natural assets in water management may reduce management costs e.g. BG is saving Euro 77,000 annually each year on water transport costs through using a reed bed filtration system in Oman. The initial outlay was Euro 199,000 with management costs of Euro 13,000 each year giving a payback period of less than two years⁴¹.
- **Improved licence to operate:** a proactive stance on BES may build stakeholder relations leading to a status as 'preferred development partner' Aggregate Industries found that employing ecosystem services valuation methodologies to a site in the UK as part of their permitting process strengthened relationships with local communities. Similarly, Italian oil and gas company, Eni, identified opportunities for enhanced revenues through maintaining license to operate and gaining access to new resources as an outcome of building a strong understanding of the value of ecosystem services at a site operating close to a national park in Italy⁴².
- **Improved access to finance:** in the future those seeking finance from the IFC, under the revised Performance Standard 6-V2⁴³, will be required to assess impacts on ecosystems services, and also achieve no net loss of natural habitat and, in critical habitats, achieve a net positive gain, thus being able to demonstrate net positive gain on a project level may become a requirement for accessing certain finance in the future.
- **Access to new revenue streams and markets:** US Federal law requires developers to compensate for any destruction of wetlands through the purchase of wetland credits. ChevronTexaco received approval in 2005 to convert an exhausted drilling site in Louisiana into a 2,800 hectare wetland to generate credits for the U.S. wetland mitigation banking market worth up to US\$150 million⁴⁶.

“As an investor, Mn Services is often faced with a lack of awareness within companies of the biodiversity risks they face. We believe that it is important that companies in the extractive sector are aware of the risks and challenges that they are facing relating to this issue.”

Kris Douma, Head of Responsible Investment & Active Ownership, Mn Services

Table 4: Risks associated with BES and the extractive sector⁴⁴

RISK	EXAMPLE
Physical	
Cost increase: Where natural assets required for resource extraction or fuel production are in short supply or where the company is operating in remote, technically difficult and sensitive environments.	Cairn estimates that the cost to the company of delayed drilling as a result of Greenpeace's campaign against the company's proposed activities in the Arcic was in the region of US\$ 4 million per day ⁴⁵ .
Disruption of operations: Years of ecosystem degradation have left many areas vulnerable to what were once termed 'natural disasters'.	The cost of damage caused by hurricane Katrina was in the region of US\$100 billion ⁴⁶ . The loss of wetlands in the area is thought to have significantly increased the impact of Hurricane Katrina through loss of storm surge attenuation opportunities ⁴⁷ .
Regulatory and legal	
Restricted access to land and resources: Restriction of access to land and resources as a result of environmental damage or stakeholder concern.	Shell rerouted its offshore pipeline at a cost of US\$ 300 million due to concerns about potential impacts of the Sakhalin 2 development on the critically endangered Western Gray Whale population ⁴⁸ .
Litigation: Companies are frequently subject to litigation as a result of their exploitation of biological resources or their adverse impacts on ecosystems and the associated human health consequences.	China's biggest gold miner Zijin Mining Group was ordered to pay a criminal fine of US\$ 4.6 million for toxic mine spills that poisoned a river, killing fish and affecting the drinking water of 60,000 people ⁴⁹ .
Pricing and compensation regimes: Governments around the world are introducing new compensation regimes and market-based instruments to help address threats to ecosystems and biodiversity.	The UK government has stated the intent to use market mechanisms to promote the conservation of biodiversity and is creating funds to support experimentation with payment for ecosystem services and biodiversity offsetting schemes ⁵⁰ . Namibia has introduced the concept of no net loss and offsetting into a Strategic Environmental Management Plan in response to an increase in application for mining permits. South Africa is working on a national biodiversity offset framework ⁵¹ . In Brazil, two states—Acre and Amazonas—have released formal or draft state law on environmental services ^{52,53} .
Market	
Changing consumer preferences: Consumers are becoming increasingly aware of the environmental credentials of companies and their products.	Interest and awareness in the issue of biodiversity has increased by almost 10% in the last two years, according to a survey of over 7,000 consumers in Europe ⁵⁴ . BP stations in Florida immediately saw consumers turning away after the Gulf of Mexico leak began in late April. Total sales declined 8-10% in May compared with the previous year ⁵⁵ .
Reputational	
Association with adverse impacts on biodiversity and ecosystems can result in severe damage to a company's brand.	The Indian government recently refused to allow mining company Vedanta to develop a US\$ 2.7 billion mine in Orissa as a result of infringements of environmental and human rights laws ⁵⁷ .
Finance	
The finance sector is increasingly engaged on the issue of biodiversity.	The Norwegian Government Pension Fund withdrew their € 604 million investment from Rio Tinto over concerns that it is causing "severe environmental damage" through joint mining operations in Indonesia ⁵⁸ and from Barrick Gold from its investments due to concerns regarding environmental performance of the Porgera Gold Mine in the Enga province of Papua New Guinea.

3.2 Factors affecting the risk profile of the industry

For further reading see:
BSR (2009) State of Global
Ecosystem Services Policy
Development

A number of trends are emerging that are of particular relevance for the mining and oil and gas sectors as they are strengthening the business case for a more strategic, risk focused and proactive stance on the issue of biodiversity and ecosystem services.

- Linkages between climate change, water management and BES are becoming clearer.
- Extraction activities are increasingly occurring in remote environments, which may contain greater biodiversity richness and abundance; demonstrating the ability to operate in accordance with stricter legal and societal expectations is fundamental to accessing these areas.
- New 'non-conventional' extraction processes and fuels are developing that have greater potential impact and/or dependence on biodiversity and ecosystem services e.g. oil sands.
- High profile environmental incidents such as the Deepwater Horizon spill, Shell's recent spill in the North Sea⁵⁹ and the review by the United Nations Environment Programme on oil contamination in Ogoniland, Nigeria⁶⁰ have placed the spotlight on risk management, environmental and social performance within the oil and gas sector in particular and benchmarked the potential cost of BES damage.
- Financing requirements are becoming more rigorous in relation to social and environmental issues (see Section 4).
- Policy and regulatory shifts (such as the move to undertake national level ecosystem service valuation studies in countries such as Brazil, India, Norway, the UK and The Netherlands) are occurring with the intent to involve business in the development of environmental markets as a way of driving large scale biodiversity conservation.
- Interest is growing amongst civil society, government and the private sector in the 'ecosystem services approach' to identifying and managing environmental, social and economic risks (see Box 2).
- Tools are emerging, tested on a range of sectors, which provide guidelines on how to understand, value and manage impacts and dependence on ecosystem services.
- The business community is expected to play a pivotal role in helping meet the new and challenging targets set at the 10th meeting of the Conference of the Parties to the Convention on Biological Diversity in Nagoya, Japan in 2010⁶¹.
- Business opportunities are developing for revenue generation linked to emerging markets for ecosystem services, in particular wetland banking and land based carbon.
- ISO26000 on social responsibility makes specific reference to BES, suggesting that the management of such issues will become increasingly central to corporate approaches⁶².

These trends are explored in more detail over the coming pages.

Box 2: Ecosystem services management

The Convention on Biological Diversity defines the ecosystem approach as a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way. The key advantage to this approach is that it results in:

- Identification of impacts and dependencies that might otherwise be missed in more traditional approaches to environmental impact assessment and management, particularly because it requires a consideration of cumulative impact and demand;
- Understanding the use people make of, and the value they place on, ecosystem services gives a better insight to their values, concerns and potential issues;
- Better informed decision-making, by full evaluation of potential trade-offs in planned developments;
- Greater scope to move towards a sustainability plan for the operation that links biodiversity, communities, climate and water management.

Source: Adapted from IPIECA (2011) Ecosystem services guidance



David Wright/FFI

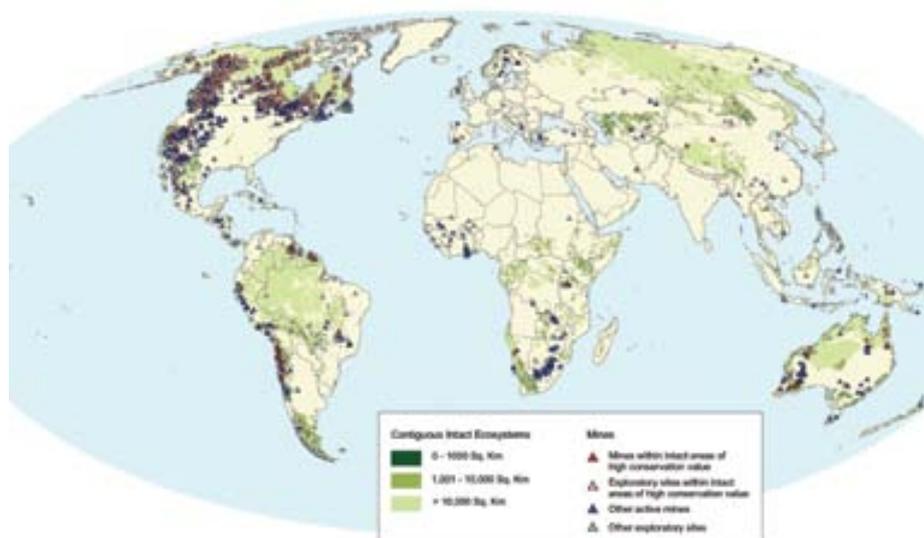
3.3 Protected areas and sensitive sites

There is a high correlation between mineral reserves and important areas of biodiversity. A study by the World Resources Institute (WRI) in 2003 showed that three quarters of active mines and exploratory sites overlap with areas of high conservation value and areas of high watershed stress⁶³ (see figure 4).

Just over 12.2% of the world's surface and less than 1% of its coastal and marine environment are currently legally protected⁶⁴. At the 10th meeting of the Conference of the Parties to the Convention on Biological Diversity in Nagoya, Japan in 2010, the 168 signatories to the CBD committed in 2010 to increase this to 17% and 10% respectively by 2020⁶⁵. Hence conflicts between the activities of extractive industries and biodiversity conservation may intensify in the future.

A significant amount of important biodiversity is not held within legally protected areas. Moves are afoot to encourage the conservation of biodiversity within the broader landscape as it becomes clear that biodiversity loss cannot be halted by focusing on conservation in protected areas alone. This means that companies failing to consider impacts on biodiversity more broadly may experience challenges in maintaining their licence to operate. At the same time there are opportunities for companies to create areas of important biodiversity through strong rehabilitation processes in areas that have previously been degraded. Nearly a third of Lafarge's operations, for example, identified opportunities for their business linked to biodiversity conservation⁶⁶.

Figure 4: map showing sensitive areas mapped against mineral reserves



Source: Marta Miranda, Philip Burris, Jessie Froy Bincang, Phil Shearman, Jose Oliver Briones, Antonio La Viña, Stephen Menard. 2003. Mining and Critical Ecosystems: Mapping the Risks.

Changes in technology and depletion of accessible resources are leading to a shift in resource extraction to more challenging environments with unique operational challenges, or to areas where there is limited regulation and/or a lack of local capacity to understand and manage impacts. Following high profile incidents such as the Deepwater Horizon incident, scrutiny of oil and gas sector operations in highly sensitive areas has intensified. The Arctic is an extreme case where the very challenging operating environment has raised significant concern about the oil and gas industry's ability to safely extract oil from the region.

The non-governmental organisation (NGO) world is divided on the issue of resource development in sensitive areas. Some stakeholders feel that some parts of the world simply should not be opened up for development, regardless of the economic opportunity they offer. Others support the view that responsible development in such areas offers the potential to provide revenues that might assist in conservation and fear the withdrawal of companies that are engaged on the issue and their replacement with other, less responsible companies. Some companies have made commitments not to develop in such sites. Members of the International Council on Mining and Metals (ICMM), for example, made a commitment in 2003 not to explore or mine in World Heritage sites. However, despite such commitments, threats to World Heritage sites from mining activities have increased by 16% since 2009⁶⁷, indicating the importance of an industry-wide commitment to protect sensitive sites and protected areas.

Extractive companies can be exposed to reputational, financial, market, regulatory and operational risk associated with impacts on protected areas or important areas of biodiversity. Higher costs may be experienced for resource extraction in remote areas and as a result of meeting regulatory requirements for compensation mechanisms (see Table 4). A study by the World Resources Institute demonstrated that oil and gas companies were differentially exposed to risks associated with potential impacts on sensitive sites, with some companies having a larger than average share of their upstream reserves in areas identified as ecologically important by environmental stakeholders, the international community, and others⁶⁸.

“Over the past fifty years, human activity has altered ecosystems significantly. Unless action is taken swiftly to reverse this damage, business performance will suffer. In the next 10 years, companies will come under political scrutiny for their impact on ecosystem services - and also foot the bill for degraded services not necessarily of their own making.”

**Karina Litvack,
Head of Governance and Sustainable Investment,
F&C Investments**

3.4 Technologies for resource extraction in challenging environments

Recent years have seen a shift towards unconventional technologies within the extractive sector. Concerns have been raised regarding the potential environmental impacts of such technologies associated with greenhouse gas emissions, increased risk of spills and water pollution.

In particular, the addition of chemicals to water to facilitate underground fracturing to enable the release of natural gas from shale formations is currently causing concern for its potential to contaminate groundwater with associated impacts to human health and wildlife. Previous studies by the United States Environmental Protection Agency (EPA) have concluded that the injection of hydraulic fracturing fluids into coalbed methane wells poses minimal threat to drinking water supplies^{69, 70}. However, more extensive use of these technologies is driving increased concern. In recognition of this, the EPA commissioned an independent study to explore the environmental and health risks associated with hydraulic fracturing.

Increases in technology and climate change have opened up the possibility of deepwater sites and Arctic locations for mineral and oil and gas extraction. However, there are concerns regarding the ability of the current status of technology to control environmental risks such as oil spills. This is a particular risk in the sensitive Arctic location where ecosystems are very fragile and a blowout similar to that experienced by BP in the Gulf of Mexico might take several years to control given constraints over operation imposed by the limited summer season and absence of control facilities. Higher losses and remedial costs might be expected for extractive companies operating in such areas. This exposes the mining and oil and gas sectors to reputational, financial and operational risk.



Bryan and Cherry Alexander/naturepl.com

3.5 Ecosystem services and ecosystem services valuation

A number of countries are now evaluating the status of ecosystem services on which they rely, both within their national boundaries and through trade. The UK was the first to complete such a National Ecosystem Assessment, showing that 30% of UK ecosystem services were degraded and that a substantial proportion of the services on which the UK relies are sourced from overseas. Similar studies are underway in Brazil, The Netherlands, Scandinavia and India. As the risks and economic implications of this to society become clear, governments are exploring different means of incentivising a reduction of impacts on ecosystem services.

Some countries are developing legislation to redress the imbalance between the true BES value and their current market value. In Costa Rica and Vietnam, for example, legislation is in place for payment for ecosystem services related to forests; six national governments are involved in the World Bank's Wealth Accounting and Valuation of Ecosystem Services Initiative⁷¹ and a number of government jurisdictions regulate biodiversity offsets for wetlands or native vegetation (US and Australia). The European Commission's recent commitment to develop a "no net loss" strategy by 2015 includes the use of payments for ecosystem services⁷². Such commitments will encourage an approach to BES management that quantifies impact and mitigation measures and may stimulate the use of mechanisms such as biodiversity offsets (see Box 3). In fact, in Europe, biodiversity offsets and other compensation mechanisms continue to gain recognition as a policy tool, with a number of countries—including the UK, France, and Sweden—taking initial steps to develop markets for biodiversity.

A number of companies—particularly in the oil and gas sector—are seeking to reduce their risk exposure by experimenting with emerging tools to help them better manage their BES impacts and their dependence on ecosystem services. Industry associations are exploring the implication of declining ecosystems for their sector, from both an opportunity and cost perspective. The International Petroleum Industry Environmental Conservation Association (IPIECA), for example, recently produced guidance on the subject. The Global Reporting Initiative is exploring the potential for metrics in this area⁷³. These tools can be applied to all aspects of a business from a business process, product or service, infrastructure project, asset site or the entire corporate business structure (see Appendix 1).

“Adopting an ecosystem services approach to environmental management is a true shift in thinking. Not a radical shift, but an evolution. It entails looking at your operations in a different way to traditional environmental management and considering the interrelationship and dependencies between different issues. This leads you to different conclusions than those that you might form from a more traditional environmental management approach.”

**Liz Rogers,
Vice President Environment,
Social Responsibility and HSSE Compliance,
BP**

Box 3: Biodiversity offsets

Biodiversity offsets were defined by the Business and Biodiversity Offsets Programme as “measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development and persisting after appropriate prevention and mitigation measures have been implemented. The goal of biodiversity offsets is to achieve no net loss, or preferably a net gain, of biodiversity on the ground with respect to species composition, habitat structure and ecosystem services, including livelihood aspects.”⁷⁴

Biodiversity offsets are mandated by law in over 30 countries e.g. the USA (wetland banking and species banking), Australia, the European Union (linked to Natura 2000) and Brazil)⁷⁵. Many other countries, from China to Mexico, have provisions for lesser forms of compensation, and several others, such as South Africa, are developing policy on biodiversity offsets. The recent Natural Environment white paper in the UK commits to experimentation with biodiversity offsets as part of a broader trend towards market-based solutions to biodiversity conservation, and the EU is launching a ‘no net loss initiative’ for 2015. As interest in environmental markets grows at a policy level, corporate interest and piloting of biodiversity offsets have been increasing.

**For further reading see:
the Business and Biodiversity
offset programme**

For the extractive sector, the emergence of valuation tools that build upon these impact assessments offers the opportunity to gain an insight into potential risks and opportunities associated with the issue. Understanding the costs and benefits of managing BES can enable more informed corporate and site level decisions. Companies that are able to demonstrate a credible approach to understanding impact, quantifying it, mitigating it and identifying appropriate biodiversity offsets may find it easier to secure and maintain their licence to operate.



3.6 Legacy and rehabilitation in the mining industry

Concern remains regarding the need to ensure restoration of the legacy of sites that have been previously mined, and to ensure that current mines have robust, well resourced closure and remediation plans. A workshop conducted in 2008 as part of the IUCN-ICMM dialogue and supported by the Post-Mining Alliance⁷⁶ on the mining industry, brought together stakeholders to explore this issue. This meeting identified a range of areas for further action, including capacity building, tax and other incentives for industry to remediate effectively, community engagement in any rehabilitation plan and consistent and dependable funding streams. These concerns place a spotlight on the need for effective remediation and closure plans.

Part 4

Implications for investors

This section considers the implications of declining BES for investors in the extractive sector. Resource scarcity, loss of biodiversity and degradation of ecosystem services such as freshwater availability are starting to present financially material risks and opportunities for extractive companies, their bankers, investors and insurers. F&C Management⁷⁷, Oekom⁷⁸, AXA⁷⁹ and EIRIS⁸⁰ have all identified the mining and oil and gas industries as high-risk sectors in terms of their impacts on BES.



4.1 Investors are exposed to both risks and opportunities

For further reading see:
UNEP FI (2010) Demystifying
Materiality

The key risks posed to investors from these sectors in relation to BES mirror those set out in Section 3. They include reputational risk, operational risks (narrowing profit margins, disruption to operations), legislation and liability related risks all leading to decreased investment return. In a study by Cambridge University, some fund managers stated that stock prices in high impact sectors are influenced by an increase in perceived risks relating to natural capital⁶¹. Equally however, a number of investors remain unconvinced of the materiality of the issue – something that is hindering broader corporate action on the issue.

Risks are emerging for investors linked to declining BES

Reputational risks

Society at large is focusing on the causes of, and responsibilities for BES loss. The financial sector is seen as a key point of leverage in either enabling or preventing BES loss. A number of financial institutions have been targeted by US based NGOs, Rainforest Action Network and the Sierra Club for their financing of extractive companies involved in mountaintop removal to access minerals (a practice which can have severe environmental consequences linked to habitat and species loss, amongst other things). Following the release of a bank scorecard on financing of organisations undertaking mountaintop removal, JP Morgan Chase, Wells Fargo, PNC, UBS and Credit Suisse released policies addressing the financing of companies that employ these practices⁶².

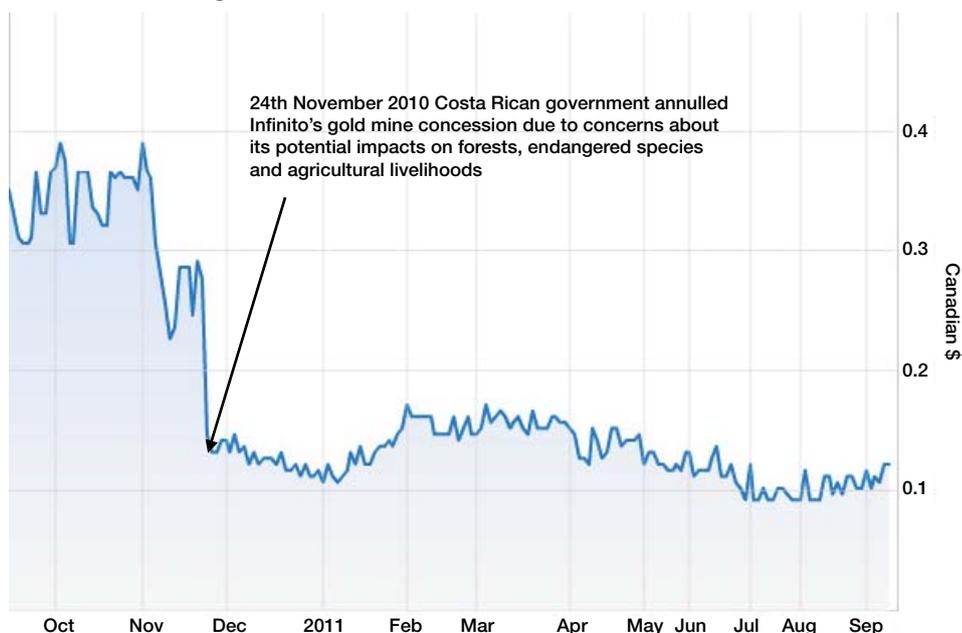
Investment returns

As the link between BES and share value is strengthening, investors are taking action to protect investment value. In an open letter a coalition of 30 investor organisations representing over US\$ 170 billion in assets urged the US Environmental Protection Agency (EPA) to initiate a review process under the Clean Water Act to evaluate the mine waste impacts of the proposed Pebble Mine on Alaska's Bristol Bay watershed, which produces approximately half of the world's commercial supply of wild sockeye salmon⁶³. The coalition cited a recent report from Trucost, the UN-backed Principles for Responsible Investment and UNEP FI that identifies costs equivalent to 11% of GDP associated with environmental externalities, and that 50% of company earnings could be at risk from environmental costs⁶⁴. This has implications for investors with widely diversified portfolios whose performance tracks that of economic growth.

Investment return can be impacted by: operational risk; liabilities and compliance issues; ability to access finance; and ability to secure and maintain licence to operate.

- **Operational risks:** according to research by Goldman Sachs, non-technical risks including ecosystem sensitivity can account for around 75% of cost and schedule failures on major oil and gas projects⁶⁵. Restriction of access of oil and gas companies to reserves they own or lease in ecologically important and protected areas could amount to a drop of 5% in shareholder value⁶⁶. Furthermore, AXA discovered higher operating margins in oil and gas companies identified as having strong biodiversity management practices⁶⁷.
- **Liabilities and compliance aspects:** there are an increasing number of cases where companies are being held financially liable for environmental damage and BES impacts. For example Shell faces a potential bill of hundreds of millions of dollars after accepting full liability for two oil spills that impacted a Nigerian community of 69,000 people in 2008 and 2009, impacting on community fishing resources in the Ogoniland region of the Niger Delta wetlands. Shell has agreed that the affected Nigerians can seek compensation in a British court, potentially opening itself up to bigger future financial and reputational damages⁶⁸. This exposes financial institutions if the legislation can affect share prices—as in the case of the Gulf of Mexico spill—or lead to reputational damage to the investor. Failure to comply with legal requirements can lead to issues in securing and maintaining licence to operate (see Figure 5 opposite).

Figure 5: Infinito Gold lost more than half its value when the Costa Rican court annulled a gold mine concession⁸⁹.



Source: <http://investing.businessweek.com/research/stocks/charts/charts.asp?ticker=IG:CN>

“One of reasons that biodiversity and ecosystem services are not conventionally included in broker notes is that historically the private sector has received such services for free. This is a long-term market failure that needs to change. Increasing resource scarcity and pressure from civil society are acting to make the issue more material, particularly for high impact sectors such as the mining, oil and gas industries. If a company is managing this issue well, it is a good indicator of the quality of overall company management.”

Steve Waygood,
Head of SRI engagement,
Aviva

- **Access to finance (credit and loans):** controls over access to finance are tightening. During the period that this report was being researched, the capital markets have not been stable. In the future it is likely that more stringent risk controls will be put in place over all forms of finance. Companies failing to demonstrate credible environmental social safeguards may increasingly be refused finance by increasingly risk averse financiers. Currently 72 financial institutions in 27 countries have adopted the Equator Principles, covering over 70% of international project finance debt in emerging markets⁹⁰. Extractive companies wishing to secure finance from these banks must have safeguards in place that ensure impacts on biodiversity are avoided. Companies seeking finance from groups such as the International Finance Corporation (IFC) will need to comply with the newly revised performance standard six which places heavy emphasis on the need to avoid, minimise and mitigate impacts on biodiversity and ecosystem services⁹¹. Failure to meet the requirements of potential financiers may significantly impact on investment return.

Opportunities are emerging linked to declining BES

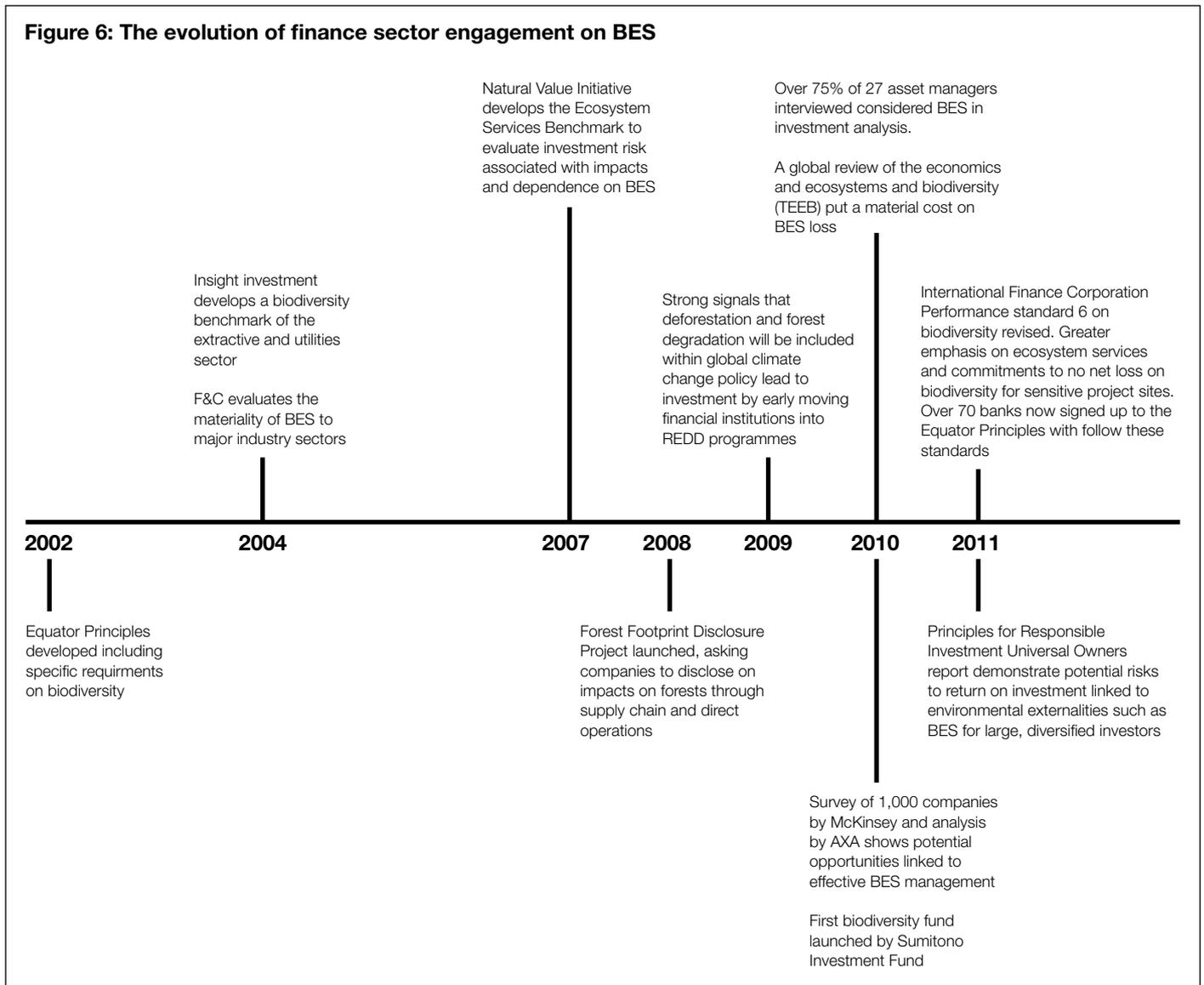
Whilst attention is primarily focused on risk management, it is also evident that there are opportunities linked to BES.

- Investment opportunities may emerge in new markets. The European Commission quotes research estimates that US\$ 2-6 trillion in business opportunities could be realised by 2050 if the private sector invests in preserving natural capital⁹².
- The global market for biodiversity offsets topped US\$ 3 billion in 2010. That's roughly seven times the size of the voluntary carbon market and a clear indication of the value of efficient and sustainable habitat restoration⁹³.
- Investment opportunities in businesses introducing new technologies and services that explicitly seek to improve resource efficiencies, thereby preserving BES, or through tailored funds.

4.2 Investors are taking steps to manage risk and realise opportunity

It is not uniformly accepted that BES is a material risk or opportunity. Policy and market signals suggest, however, that it will become more so in the medium term. Investors that are aware of this and are mobilising to understand and safeguard their investments against impact and dependence on BES may attain competitive advantage⁹⁴. A survey of asset managers by UNEP Finance Initiative (UNEP FI) in 2010 showed that more than 75% of respondents had policies in place on BES and over 80% were engaging with companies on the issue⁹⁵. Rabobank, for example, has developed a specific policy on biodiversity and ecosystem services that governs the asset management activities of its subsidiary Robeco.

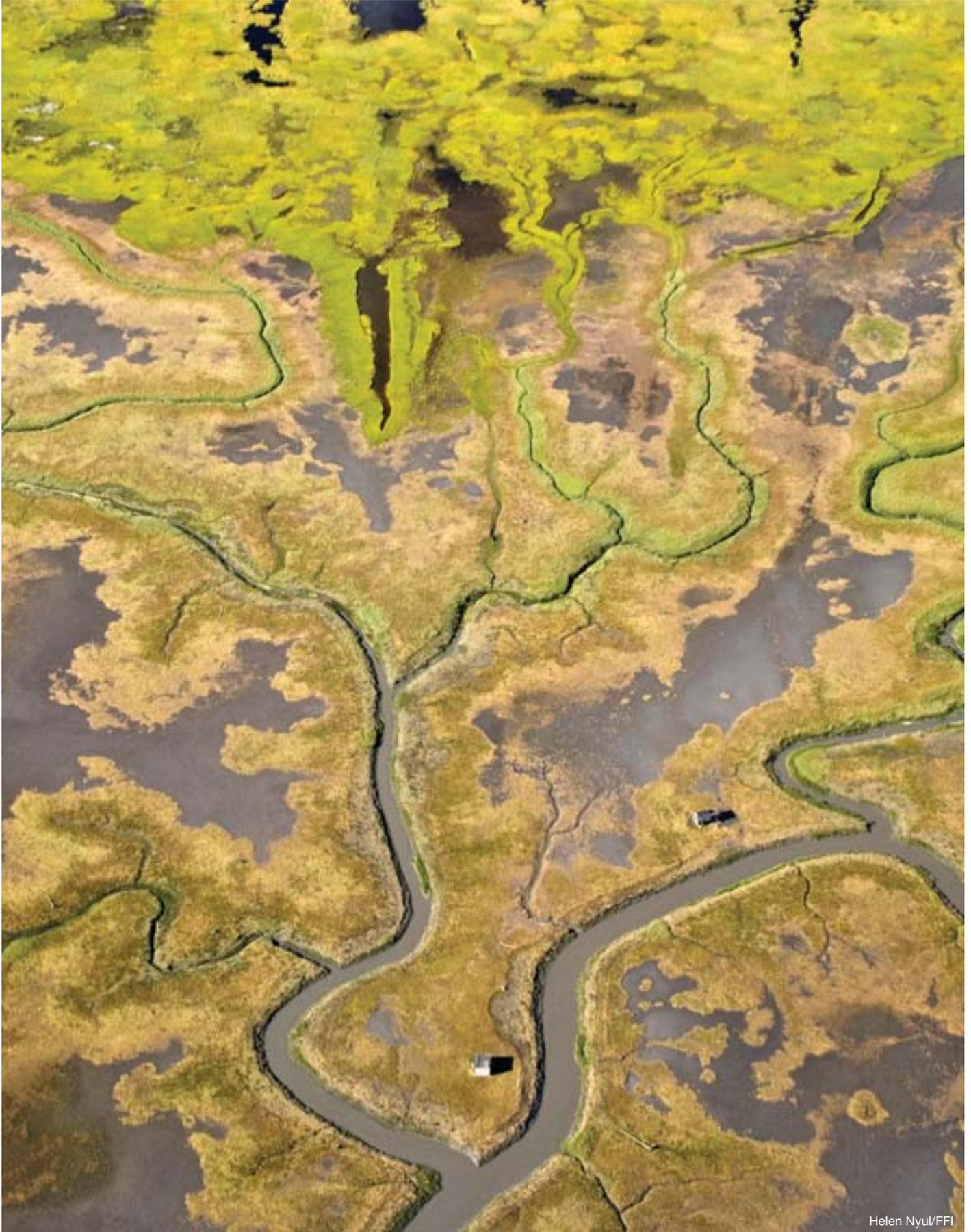
Figure 6: The evolution of finance sector engagement on BES



Investors are also capitalising on opportunities. In 2010 the Sumitomo Trust launched a fund that invests in listed companies that engage in biodiversity preservation as part of their sustainable development programmes. The investment universe is focused on companies with the technologies that reduce adverse impacts to biodiversity, companies with the technologies that can secure biodiversity, and companies with medium- or longer-term plans to secure biodiversity⁹⁶. In addition, engagement in environmental markets is growing. Trades in avoided deforestation carbon credits on the voluntary carbon markets, for example, increased by 600% from 2009 to 2010. This is largely as a result of recent progress in REDD methodologies together with increasing political and investor certainty over the inclusion of REDD within climate policy⁹⁷.

This section outlines the Ecosystem Services Benchmark methodology (ESB) developed and used by the Natural Value Initiative.

Part 5 Methodology



Helen Nyul/FFI

5.1 The Ecosystem Services Benchmark

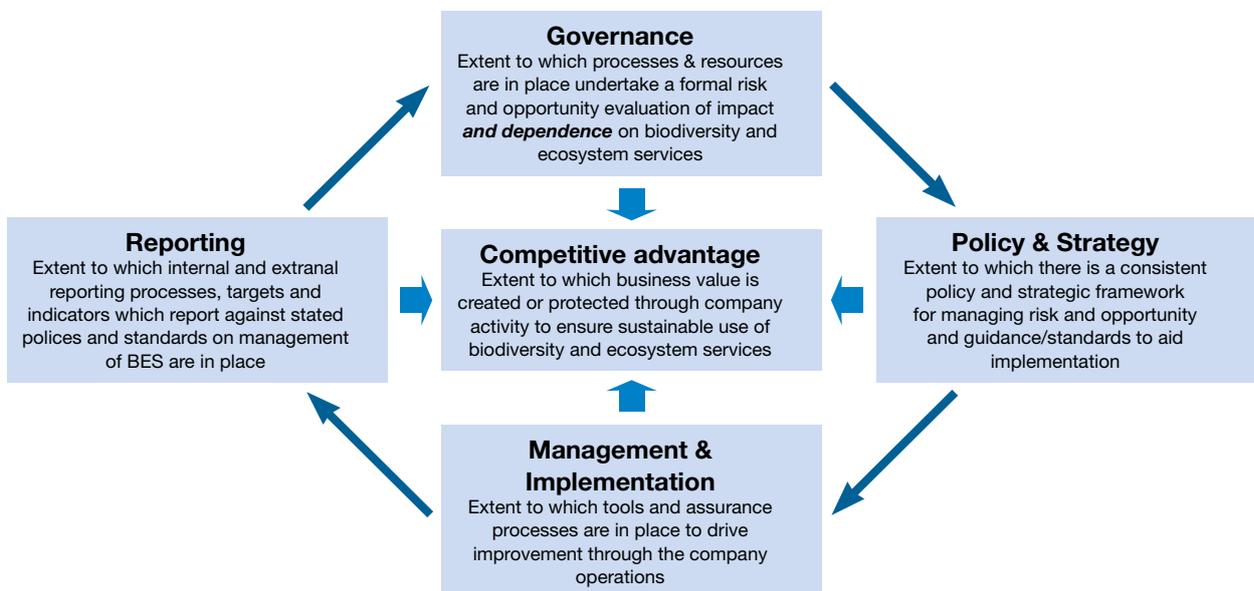
The Ecosystem Services Benchmark (ESB) is based on a benchmarking methodology that was originally developed by the UK-based asset manager Insight Investment and Fauna & Flora International for the oil and gas⁹⁸, mining and utilities sectors. This methodology was updated and adjusted reflecting the increasing maturity of thinking on this issue and the recent developments in tools and approaches to understand and manage impacts and dependence on ecosystem services. For each sector the survey focused on corporate management approaches to biodiversity and the extent to which ecosystem services thinking had been applied to issues such as water management, biodiversity management and the company's response to climate change. The following were areas of focus in the analysis:

- **Biodiversity management:** the identification and management of impacts (positive and negative) on wildlife and habitats which can have an associated impact on ecosystem services.
- **Water management:** the use of ecosystem services thinking in aiding the management of access to water and maintenance of water quality.
- **Climate adaptation and mitigation:** the potential role of natural habitats in aiding in climate mitigation and adaptation.

The analysis of the oil and gas sector initially included consideration of biofuels and the extent to which safeguards were in place to avoid and minimise potential impacts on BES as a result of energy crop production. However, scores relating to biofuels were excluded from our final analysis as the degree of usage of biofuels (and the legal requirements to use biofuels) varied between the companies surveyed. This meant comparison between companies on their management of biofuels was not meaningful.

The ESB considers five interdependent categories of performance: competitive advantage, governance, policy and strategy, management and implementation, and reporting (see Figure 7). It assigns levels of performance ranging from one (poor performance) to four (best practice).

Figure 7: The components of the Ecosystem Services Benchmark



Some elements of the benchmark play a greater role in risk management and realising opportunities than others. We therefore adjusted the relative scores of each section as follows in order to calculate the final score and level of performance: governance (20%), policy and strategy (20%), reporting (20%), management and implementation (25%) and competitive advantage (15%). The low weighting for competitive advantage reflects the uncertainty surrounding emerging activities on ecosystem services and competitive advantage. See Appendix 2 for further details on the methodology used.

5.2 The Approach

The analysis was conducted from January 2010 to July 2011 and was based on publicly available information. Each company was invited to discuss the results to ensure that these were an accurate reflection of its activities and to supplement information in the public domain with internal information. Of the 30 companies, 19 (69%) responded to this invitation, with two refusing and the remaining nine being unresponsive. Strengths, weaknesses and suggestions for improvement were highlighted for each company. It is these suggestions for improvement that the investors involved in this study are using in their ongoing dialogue with the companies in the analysis.



Helen Nyul/FFI

The companies included within the analysis are outlined in Table 5. These were selected based upon interests held by collaborating investors during the period of analysis and to ensure representation from both the developed and developing world.

5.3 Companies analysed

Table 5: Companies within the analysis

Company	Stock Exchange	Market Capitalisation (billion)		Turnover (billion)	
Mining					
Amg Advanced Metallurgical Group N.V. (AMG)	Euronext Amsterdam	US\$ 0.6	€ 0.4	US\$ 1.0	€ 0.7
Anglo American plc (AAL)	London Stock Exchange	US\$ 62.8	€ 45.5	US\$ 32.9	€ 23.9
Arcelor Mittal (MT)	Euronext Amsterdam	US\$ 49.4	€ 35.8	US\$ 78.0	€ 56.5
Barrick Gold Corporation (ABX)	Toronto Stock Exchange	US\$ 48.3	€ 35.0	US\$ 10.9	€ 7.9
BHP Billiton Ltd (BHP)	Australian Securities Exchange	US\$ 250.9	€ 181.9	US\$ 52.8	€ 38.2
Cemex SAB de CV (CEMEXCPO)	Mexican Stock Exchange	US\$ 7.5	€ 5.4	US\$ 14.1	€ 10.2
First Quantum Minerals Ltd (FM)	Toronto Stock Exchange	US\$ 12.1	€ 8.8	US\$ 2.4	€ 1.7
Freeport-McMoran Copper & Gold Incorporated (FCX)	New York Stock Exchange	US\$ 50.8	€ 36.8	US\$ 19.0	€ 13.8
Holcim Ltd (HOLN)	SIX Swiss Exchange	US\$ 22.1	€ 16.0	US\$ 21.7	€ 15.7
Lafarge S.A. (LG)	Euronext Paris	US\$ 15.9	€ 11.5	US\$ 16.2	€ 11.7
Lonmin plc (LMI)	London Stock Exchange	US\$ 4.3	€ 3.1	US\$ 1.6	€ 1.2
Rio Tinto plc (RIO)	London Stock Exchange	US\$ 135.4	€ 98.2	US\$ 60.3	€ 43.7
Vedanta Resources (VED)	London Stock Exchange	US\$ 8.0	€ 5.8	US\$ 11.4	€ 8.3
Xstrata plc (XTA)	London Stock Exchange	US\$ 63.16	€ 45.8	US\$ 30.5	€ 22.1
Oil and Gas					
BP plc (BP)	London Stock Exchange	US\$ 139.2	€ 100.9	US\$ 309.0	€ 223.9
BG Group plc (BG)	London Stock Exchange	US\$ 66.2	€ 48.0	US\$ 17.2	€ 12.4
Cairn Energy (CNE)	London Stock Exchange	US\$ 8.6	€ 6.2	US\$ 1.6	€ 1.2
Encana Corporation (ECA)	Toronto Stock Exchange	US\$ 21.7	€ 15.7	US\$ 8.9	€ 6.4
Eni Spa (ENI)	Milan Exchange	US\$ 88.1	€ 63.9	US\$ 137.3	€ 99.5
ExxonMobil Corporation (XOM)	New York Stock Exchange	US\$ 403.5	€ 292.6	US\$ 370.1	€ 268.2
Gazprom N36.8eft (SBN)	London Stock Exchange	US\$ 22.5	€ 16.3	US\$ 117.2	€ 85.0
Lukoil (LKOH)	London Stock Exchange	US\$ 50.8	€ 36.8	US\$ 105.0	€ 76.1
Neste Oil OYJ (NES1V)	Helsinki Stock Exchange	US\$ 3.7	€ 2.7	US\$ 2.2	€ 1.6
Petrobras (PETR4)	Rio De Janeiro Stock Exchange	US\$ 185.6	€ 134.6	US\$ 16.4	€ 11.9
PT Perusahaan Gas Negara Persero Terbuka (PGAS)	Jakarta Stock Exchange	US\$ 11.0	€ 8.0	US\$ 139.0	€ 100.4
Sasol Ltd (SOL)	Johannesburg Exchange	US\$ 32.6	€ 23.6	US\$ 4.4	€ 3.2
SBM Offshore N.V. (SBMO)	Euronext Amsterdam	US\$ 4.6	€ 3.3	US\$ 3.1	€ 2.2
Royal Dutch Shell plc (RDSB)	London Stock Exchange	US\$ 225.9	€ 163.8	US\$ 378.2	€ 274.2
Statoil ASA (STL)	Oslo Stock Exchange	US\$ 70.3	€ 51.0	US\$ 94.6	€ 68.6
Tullow Oil plc (TLW)	London Stock Exchange	US\$ 18.2	€ 13.2	US\$ 1.1	€ 0.8

Source: <http://www.corporateinformation.com> accessed 29 July 2011

The Insight Investment Biodiversity Benchmark

It should be noted that, although this work builds on the benchmarks led by Insight Investment in 2004 and 2005, the results of the 2011 analysis are not entirely comparable with the previous benchmarks as a different set of companies was evaluated. However, since more than half of the companies are common to both analyses, broad trends and improvements can be identified. Companies were selected on the basis of the investors with whom the authors were working. As a result, not all of the companies included in the 2005 Insight Investment benchmark were included in the 2011 review.

“We have long understood that extractive companies leave deep footprints on the planet, and last year the oil spill in the Gulf of Mexico gave us a dramatic demonstration of just how deep those footprints can be. Now, NVI has given us a tool we can use to do help us do that assessment, as well as some very valuable data on biodiversity impacts and policies for a group of large extractive companies. This tool gives us a superb way to assess the quality of management and the potential risks this poses for extractive companies, and we intend to use it as we carry out those assessments.”

Julie Gorte, Senior Vice President for Sustainable Investing, Pax World



Jeremy Holden/EFI

5.4 How will this study be used?

The investors and the investor advisors who collaborated on this study (outlined on page 92-93) are using it to support their existing commitments to integrate social and environmental performance into their environmental and social governance analysis.

The collaborating investors will use the study to:

- **Build capacity to engage on the issue of BES:** investors joined us for almost half of the interviews held with companies, enabling them to build an enhanced understanding of BES management within the two sectors.
- **Identify areas of risk and opportunity within their investment portfolio:** through this process, investors have identified improvement opportunities for each company and sector. Where companies have been identified as lacking well developed systems to identify and manage impacts and dependence on BES, the information from the ESB is being used to engage those companies.
- **Encourage improved performance through engagement with companies identified as high risk:** the information from the ESB will be used as a part of investors' engagement strategies with important investments. Where opportunities have been identified, companies have been asked in a formal letter from the investors to improve their approach to managing the issue. Investors may also use a range of other actions to influence change, including one-to-one meetings with companies, collaborations with other investors, and in certain circumstances if progress is not being made, may consider filing a shareholder resolution.
- **Disinvest from companies that are known to be infringing legal requirements:** for the direct purpose of protecting BES or protecting investor clients from companies that are identified as high risk from the analysis above and continue to show no or minimal activity. This divestment approach is not used by all investors involved in this study, a number of whom focus on engagement with companies as a primary means of changing corporate behaviour and performance.
- **Work to further embed BES within their broader environmental, social and governance analysis:** using the learning from this analysis to review and update their investment procedures and encourage their clients to do the same. Anecdotal evidence is building that BES is becoming increasingly material. It is important that investors understand how this can impact individual investments, as well as large portfolios. Given that the oil and gas and the mining sectors make up significant shares of stock exchanges worldwide, impacts on the share price of big companies can move entire exchanges – affecting even short-term focused traders.

Part 6 Results

This section outlines the findings from the benchmark study conducted in 2011 and compares them, where possible, with the benchmarking study conducted by Insight Investment and Fauna & Flora International in 2005.



Stuart Butchart

6.1 Overall performance against the Ecosystem Services Benchmark

Fourteen companies were reviewed in the mining sector, with a market capitalisation of US\$ 726 billion (529.8 billion Euros)⁹⁹. Sixteen companies were reviewed in the oil and gas sector, with a market capitalisation of US\$ 1,877 (1,370 billion Euros). The companies reviewed were headquartered in the USA, Brazil, South Africa, Italy, Indonesia, Norway, Finland, Russia, Canada, Mexico, France, Luxembourg, The Netherlands, Switzerland and the UK.



6.1.1 Measuring the quality of BES management

The table below divides the 30 companies that were benchmarked in accordance with their performance against the Ecosystem Services Benchmark. Within each category, companies are presented in alphabetical order rather than in order of their performance.

Table 1: Benchmark results (presented in alphabetical order)

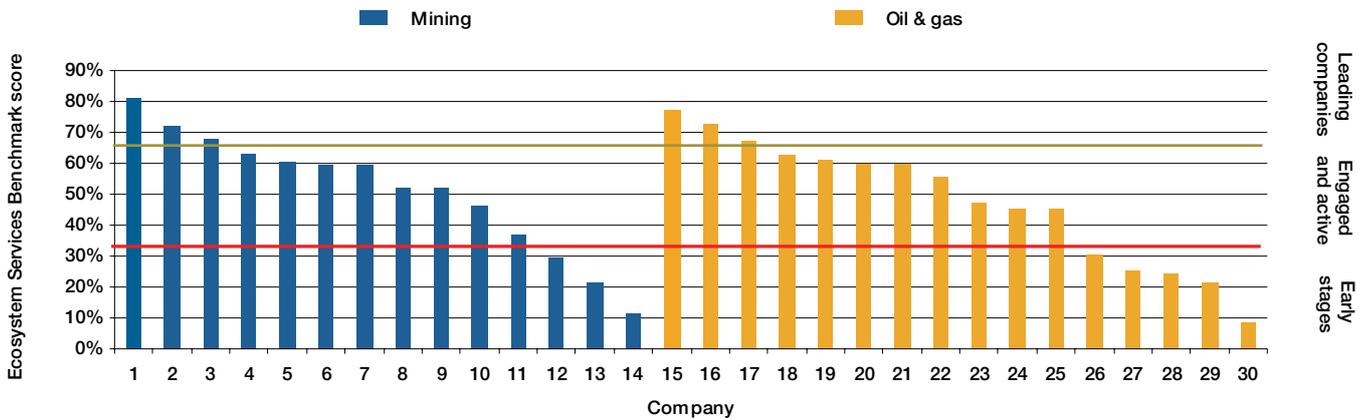
	Mining	Oil & Gas
Leading companies: Risk and opportunity formally assessed, comprehensive integration of BES into policy and management systems	Anglo American plc (AAL)*^ Rio Tinto plc (RIO)*^ Xstrata plc (XTA)^	BG Group plc (BG)*^ Eni Spa (ENI)*^ Royal Dutch Shell plc (RDSB)*^
Companies engaged and actively managing BES: Awareness demonstrated through acknowledgement of company's impact on biodiversity, its inclusion within certain aspects of risk management and/or some reference within policy documents and/or management tools	Barrick Gold Corporation (ABX) BHP Billiton Ltd (BHP)*^ Freeport-McMoRan Copper & Gold Incorporated (FCX)* Cemex SAB de CV (CEMEXCPO)^ Holcim Ltd (HOLN)*^ Lafarge S.A. (LG)*^ Lonmin plc (LMI)^ Vedanta Resources (VED)*^	BP plc (BP)*^ Cairn Energy (CNE)^ Encana Corporation (ECA)* ExxonMobil Corporation (XOM)* Neste Oil OYJ (NES1V)*# Petrobras (PETR4) Sasol Ltd (SOL)+* Statoil ASA (STL)*^
Companies in early stages of BES management: Risk evaluation in early stages of development, activity to manage impact and dependence limited	Amg Advanced Metallurgical Group N.V. (AMG) ArcelorMittal (MT)*+ First Quantum Minerals Ltd (FM)	Gazprom Neft (SBN) Lukoil (LKOH) PT Perusahaan Gas Negara Persero Terbuka (PGAS)*# SBM Offshore N.V. (SBMO)# Tullow Oil plc (TLW)^
<p>* Companies that engaged with the NVI to confirm the accuracy of our analysis + Mining represents a small but growing part of the company's operations, BES management practices are evolving # These companies have a lower risk exposure to BES than the other companies included in the analysis. Management activities on BES appear appropriate for the level of risk exposure ^ Companies reviewed in the 2005 Insight Investment and Fauna & Flora International benchmark Companies highlighted in bold type had the highest benchmark scores for their respective sectors</p>		

See Appendix 2 for the limitations of the analysis to be considered in interpreting these results.

A significant amount of the information required to form a judgement on corporate management of BES is not in the public domain. On the whole companies that engaged with us were able to demonstrate better performance than those that did not. As a result those companies that did not engage in our research process may have a stronger performance on this issue than our analysis suggests. The results below should be reviewed with this in mind.

There is a range of performance within each of the three groupings of companies (see Figure 1) i.e. within these groupings, the sophistication of the company's approach to managing BES varies considerably.

Figure 1: The extent of sophistication of BES management systems varies considerably across the companies surveyed



Those companies identified as in the early stages of BES management pose a greater risk to investors. The ESB measures the maturity of the company's management systems on biodiversity. It does not measure the extent to which the company is exposed to risk. PT Perusahaan Gas Negara Persero Terbuka and SBM Offshore provide pipelines and services to the oil and gas sector respectively and Neste Oil refines oils. As a result their biodiversity risk exposure is likely to be less than the major oil and gas producers on this issue. Reflecting this difference in risk exposure, the percentages quoted below relate to 27 companies, rather than the full 30 companies analysed.



Stuart Butchart

A high level analysis of risk was undertaken, which considered three factors as outlined in the table below.

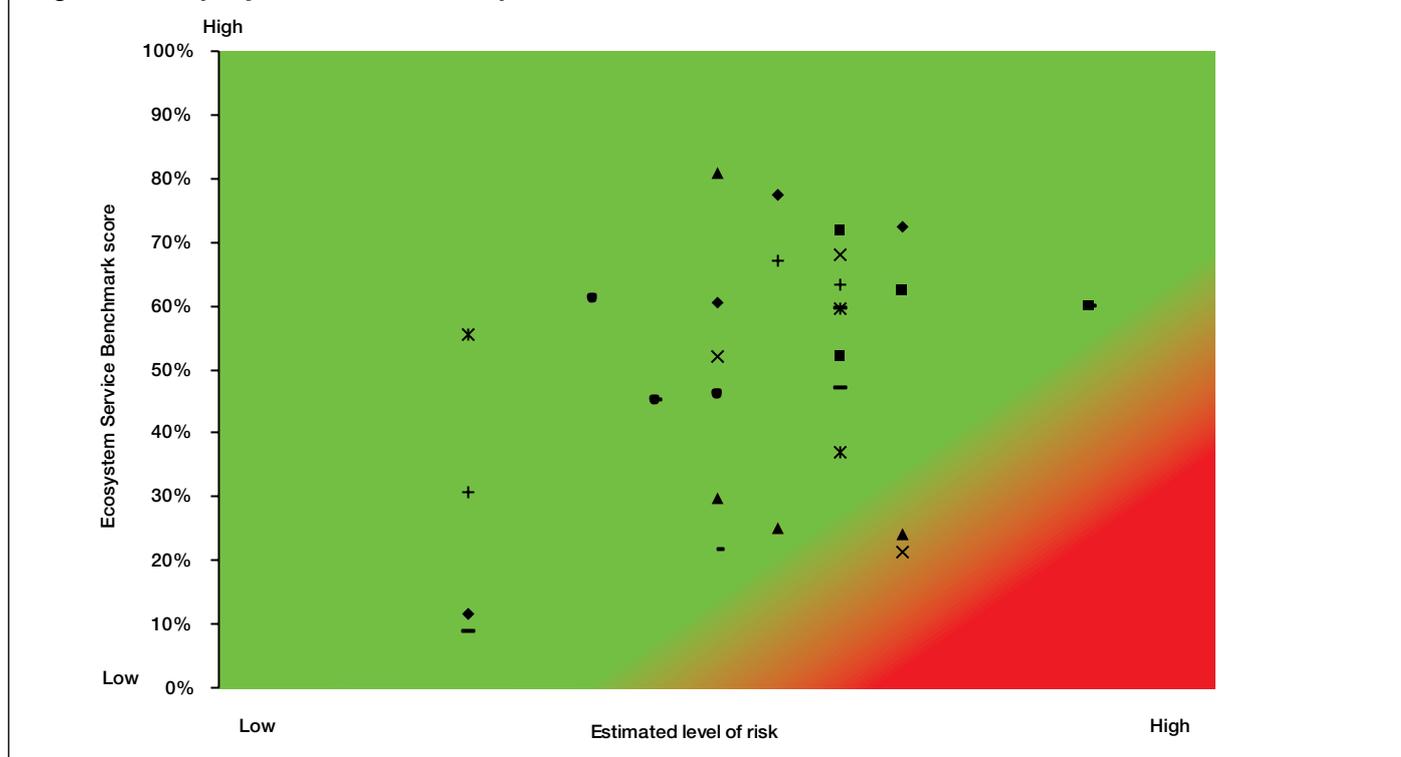
6.1.2 Measuring corporate risk exposure to BES

Table 6: Factors used in the high level analysis of risk

RISK FACTOR	RISK LEVELS		
	High	Medium	Low
Percentage of corporate operations in water-stressed locations as identified by the company in its Carbon Disclosure Project water disclosure	> 60%	30-60%	0-30%
Percentage of corporate operations located in, near or containing ecologically sensitive sites reported using the Global Reporting Initiative indicator, EN11	30-100%	10- 30%	0-10%
Conducting of operations considered to be higher risk e.g. deepwater, oil sands, Arctic activities	Yes or No		

Where the data is not disclosed, the risk profile defaults to the average score of those companies within the sector that do disclose data. There are, of course, many flaws with such a crude analysis. A company may, for example, be located near an ecologically sensitive area because it has strong BES management programmes in place that have restored areas of degraded land resulting in designation of a protected area. Alternatively, a company may have 80% of its operations in a water-stressed location but is working with local stakeholders to carefully manage risk. The analysis is presented in order to demonstrate the importance of marrying an evaluation of management systems with the risk profile of the business, particularly where comprehensive risk evaluations are still being developed by the companies concerned.

Figure 8: Company benchmark scores plotted as a function of estimated risk associated with BES



When company risks are analysed in this way and plotted against benchmark performance, it can be seen that most companies are comfortably operating BES management systems that are broadly in line with their estimated risk profiles (see Figure 8). There are a number of exceptions to this. These companies were assessed to be more exposed on this issue. Many of the companies surveyed recognise that there are a range of risks associated with this issue and are working to evaluate them at a range of levels.

6.1.3 General trends and progress made since 2005

The following high-level trends emerged from our analysis:

- A full 81% (22) of the companies considered the issue of biodiversity to be material to their business (based on public policy disclosures).
- Both the mining and oil and gas sectors have significantly matured in their approach to BES management since the Insight Investment benchmark of 2005, more companies have detailed policy commitments on BES, risk assessments are more sophisticated and more extensive and piloting of emerging methodologies on ecosystem services is underway.
- Over 90% (25) of the companies reviewed included biodiversity within their corporate risk management practices to some extent based on public disclosures; for the majority this analysis addressed both protected areas and sensitive sites that are not protected by law.
- The number of companies having completed corporate-level biodiversity risk assessments for all sites had doubled since the previous benchmark, but remains low, it was rarely clear from public disclosures if companies had actions underway at all sites considered to be high risk. Furthermore, few companies disclosed the process underlying their risk evaluations, making it challenging to form a judgement on their robustness.
- Reporting and metrics remain a key area of weakness throughout all companies due to a lack of appropriate, widely agreed BES performance indicators. This remains an inherently challenging area due to the complexities of measuring impact on and monitoring change of BES.
- Efforts to integrate BES into broader environmental management (water management, climate adaptation, biofuels sourcing) are still evolving. Leading companies are making explicit reference to ecosystem services in policy documentation and integrating natural assets into water and climate adaptation planning and management.



Box 4: Sector leaders

Mining sector leader: Rio Tinto

- **Policy:** Rio Tinto has a robust external policy statement that was developed in conjunction with external stakeholders. It sets out a commitment to having net positive impact on biodiversity. This remains the most far-reaching policy commitment of all the companies surveyed. Ecosystem services thinking is integrated into water management and climate strategy; for example, ecosystem services valuation is included under one of three strategic themes for water management in Rio Tinto's stand-alone water strategy.
- **Governance:** the company has a risk-focused approach to BES management. It has developed a range of tools through external consultation, including a group-wide biodiversity values assessment protocol to evaluate the value of land holdings in terms of biodiversity. Rio Tinto has mapped the location of its sites against known protected areas and sensitive sites for biodiversity. These tools have been used to prioritise activity at a site level.
- **Management and implementation:** biodiversity action planning guidance has been developed in conjunction with NGO partners, piloted and is being rolled out across all high risk sites identified through the risk evaluation process above. Biodiversity offset guidance has been developed in conjunction with stakeholders and the company is developing an external audit process with IUCN to provide assurance over its net positive impact commitment.
- **Reporting:** the company reports extensively on the issue of biodiversity. Case studies are combined with an effort towards more quantified reporting in support of the company's commitment to net positive impact. A net positive impact accounting tool is under development to enable monitoring of Rio Tinto's strategic commitment.
- **Competitive advantage:** the company is exploring the potential value of natural capital held within its land holdings and is experimenting with biodiversity offsets, testing/ piloting emerging tools for ecosystem services and engaging with emerging markets for ecosystem services.

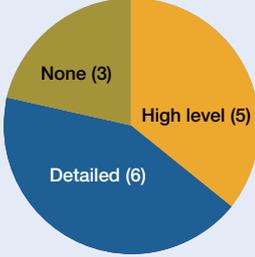
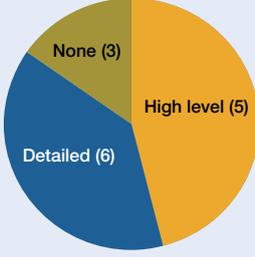
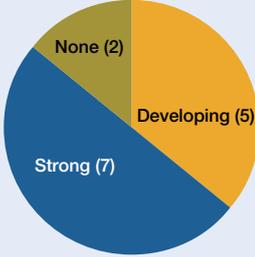
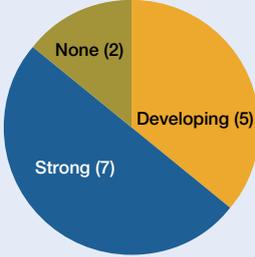
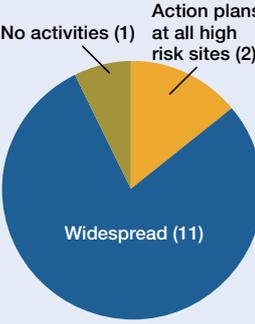
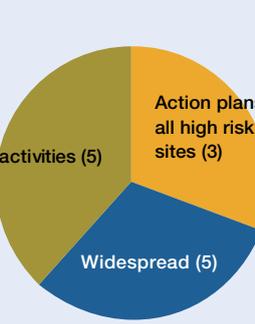
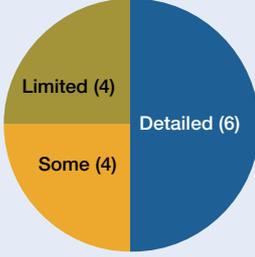
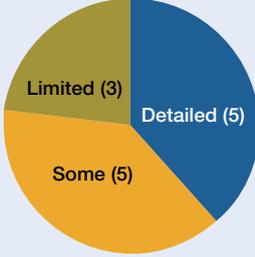
Oil and gas sector leader: Royal Dutch Shell plc

- **Policy:** Shell has a robust policy statement that commits the company not to explore in World Heritage sites and to develop biodiversity action plans in areas of high biodiversity value. The company clearly defines what it means by this. Shell requires its biofuels suppliers to abide by contractual requirements that ensure they avoid the clearing of areas of high biodiversity value.
- **Governance:** the company adopts a risk-focused approach to BES management with identification of high risk areas for biodiversity early in the resource development process.
- **Management and implementation:** biodiversity action plans are in place for all sites in or near IUCN protected areas, RAMSAR sites, Important Bird Areas, Man and Biosphere Reserves and Natura 2000 sites. The company has ongoing NGO partnerships aimed at developing and implementing tools and approaches for biodiversity management and providing assurance over Shell's current approach. The IUCN has conducted an independent review of the quality of Shell's biodiversity action plans.
- **Reporting:** strong disclosures are made against the Global Reporting Initiative indicators, in particular the name and location of ecologically sensitive sites near to Shell's operations are listed on the company website.
- **Competitive advantage:** The company has engaged in cross-sectoral initiatives such as the Business and Biodiversity Offset Programme to build understanding and experience of best practice biodiversity offset development. It has also worked with IUCN to explore the potential opportunities linked to emerging markets for forest-linked carbon credits (REDD). The company is working through industry bodies like IPIECA, Business for Social Responsibility, WRI and others on the topics to explore ecosystem services concepts and tools and how to embed this thinking into existing processes.

Key statistics are given within Table 7. Detailed discussion is provided in sections 6.2.1-6.2.5

6.2 Key findings by sub heading

Table 7: Scorecard showing key aspects of biodiversity management in each sector

MINING (number of companies = 14)	OIL & GAS (number of companies = 13)																
<p>Biodiversity policy commitments</p>  <table border="1"> <tr><th>Category</th><th>Count</th></tr> <tr><td>High level</td><td>5</td></tr> <tr><td>Detailed</td><td>6</td></tr> <tr><td>None</td><td>3</td></tr> </table>	Category	Count	High level	5	Detailed	6	None	3	<p>(x) = number of companies</p>  <table border="1"> <tr><th>Category</th><th>Count</th></tr> <tr><td>High level</td><td>5</td></tr> <tr><td>Detailed</td><td>6</td></tr> <tr><td>None</td><td>3</td></tr> </table>	Category	Count	High level	5	Detailed	6	None	3
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High level	5																
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None	3																
<p>Corporate biodiversity risk evaluation in place</p>  <table border="1"> <tr><th>Category</th><th>Count</th></tr> <tr><td>Strong</td><td>7</td></tr> <tr><td>Developing</td><td>5</td></tr> <tr><td>None</td><td>2</td></tr> </table>	Category	Count	Strong	7	Developing	5	None	2	 <table border="1"> <tr><th>Category</th><th>Count</th></tr> <tr><td>Strong</td><td>7</td></tr> <tr><td>Developing</td><td>5</td></tr> <tr><td>None</td><td>2</td></tr> </table>	Category	Count	Strong	7	Developing	5	None	2
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Category	Count																
Widespread	5																
Action plans at all high risk sites	3																
No activities	5																
<p>Extent of reporting on BES (see note below)</p>  <table border="1"> <tr><th>Category</th><th>Count</th></tr> <tr><td>Detailed</td><td>6</td></tr> <tr><td>Some</td><td>4</td></tr> <tr><td>Limited</td><td>4</td></tr> </table>	Category	Count	Detailed	6	Some	4	Limited	4	 <table border="1"> <tr><th>Category</th><th>Count</th></tr> <tr><td>Detailed</td><td>5</td></tr> <tr><td>Some</td><td>5</td></tr> <tr><td>Limited</td><td>3</td></tr> </table>	Category	Count	Detailed	5	Some	5	Limited	3
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Note: detailed reporting is considered to comply with existing sector specific reporting guidance on BES. 'Good' reporting includes specific disclosures on biodiversity, some disclosures on sensitive sites and targets. 'Limited' reporting makes only a brief reference to BES, with no targets, quantified metrics or management system details provided.

6.2.1 Policy and strategy

Policy and strategy commitments provide a framework to drive the management of BES risks. Policy is defined as high-level aspirational commitments that set out the company's position on the issue¹⁰⁰. The benchmark examined policy commitments on both biodiversity and water.

Table 8: Performance against policy benchmark criteria

Criteria		Proportion and (number) of companies			
		Mining		Oil & gas (n=13)	
		2005	2011	2005	2011
Biodiversity	Policy commitment	85% (11)	79% (11)	92% (12)	84% (11)
	Commit to avoiding development in ecologically sensitive sites e.g. World Heritage sites	-	50% (7)	-	18% (2)

Biodiversity:

The number of high-level corporate commitments to biodiversity i.e. a brief reference within a broader environmental or sustainability policy, had remained broadly the same since the 2005 survey. The number of more detailed policy commitments had increased from five out of 26 companies in 2005 to 11 out of 27 companies in 2011. This suggests that more companies within these sectors perceive the issue as material. Reference to ecosystem services within policy commitments was more widespread within the mining than oil and gas sector. One third of the 27 companies made some form of commitment to avoid or understand impacts on ecologically sensitive sites. The extent to which such policy commitments apply to third parties is becoming clearer with 59% of companies making this clear, compared to 27% in 2005.

Box 5: Examples of strong policy commitments on biodiversity

- **Xstrata's** Sustainable Development policy commits the company to: avoid net losses or degradation of natural habitats, biodiversity and landscape functions such as watershed and microclimate management.
- **Eni's** Sustainability Policy commits the company to; "integrat[ing] the conservation of biodiversity, ecosystems and ecosystem services, during the whole life cycle and all its operational sites"; "identify[ing] and assess[ing] all potential impacts of its operations on biodiversity and implement[ing] mitigation actions, including offsets in order to minimise any adverse effects". It makes specific reference to ecosystem services and stresses the importance of combining the conservation of biodiversity and ecosystems with the sustainable development of local communities.

Other companies with detailed policy commitments: **Barrick, Rio Tinto, Anglo American, BG, BHP Billiton, Shell, Holcim (not public).**

Policy commitments are increasing in quality with three companies now making commitments to causing “no net loss” to biodiversity or having a net positive benefit for biodiversity. Such commitments mean that the company undertakes activities to avoid and minimise its impacts on biodiversity, to undertake restoration and to offset any residual impacts so no loss remains. Where the gain exceeds the loss, the term ‘net gain’ may be used instead of no net loss¹⁰¹. This commitment acts as a strong framework to drive forward performance improvements. In the future those seeking finance from the IFC, under the revised Performance Standard 6 –V2¹⁰², will not only be required to assess impacts on ecosystems services, but will also have to achieve no net loss of natural habitat and, in critical habitats, achieve a net positive gain. Thus being able to demonstrate net positive gain on a project level may become a requirement for accessing certain finance in the future, and companies already doing so will be well positioned to apply for such financing.

It is fair to say that those companies that have made such commitments are still working to implement them. Remaining concerns by some on how such a commitment can be measured or demonstrated are being addressed by the growing professionalism of this field and new available tools. For instance, the Business and Biodiversity Offsets Programme (see Appendix 1) will be releasing a draft standard on biodiversity offsets in early 2012 that will enable third party verification and auditing of companies’ biodiversity offsets, addressing how ‘no net loss’ can be measured or demonstrated.

Ecosystem services more broadly

Eleven of the 27 companies were developing detailed stand-alone water standards and strategy documents to enable this more strategic approach to the issue that enables shared learning, efficiencies and a consistent approach to water management throughout their operations. The majority of these companies felt that they included ecosystem services within their water policy, however, only two did so explicitly.



Juan Pablo Moreiras/FFI

6.2.2 Governance

The ESB looks for evidence of responsibility being assigned within the company for the management of BES, for the presence of corporate-level risk assessments and associated risk management plans which link to site-level risk assessments. Strong performance in this area ensures that companies consider and manage wider strategic risks posed by operating in ecologically sensitive sites or in areas of scarce ecosystem services.

Table 9: Performance against governance benchmark criteria

		Proportion and (number) of companies			
Criteria		Mining		Oil & gas (n=13)	
		2005 n=13	2011 n=14	2005	2011
Biodiversity	Some form of corporate-level biodiversity risk assessment	77% (10)	86% (12)	100% (13)	100% (13)
	Risk assessments undertaken for all sites	0% (0)	21% (3)	23% (3)	31% (4)
	Consider risks associated with broader ecologically sensitive sites, not just protected areas	-	71% (10)	-	77% (10)

Responsibilities

For the majority of companies, responsibility was clearly assigned for the management of biodiversity and water. Three of the 27 companies had external advisory committees in place focusing on the issue of biodiversity. Eight of the 27 companies had strategic partnerships in place with environmental NGOs. Both provide a means of challenging thinking on BES issues and providing technical input in risk identification, tools design and implementation.

Identifying biodiversity corporate-level biodiversity risk

The most well developed approaches to corporate level risk management used mapping tools such as the Integrated Biodiversity Assessment Tool or the World Database of Protected Areas available through the UNEP WCMC Proteus partnership (see Appendix 1) to identify potential risks. Failure to adequately understand and manage impacts on ecologically sensitive sites—whether protected or simply identified by stakeholders as important—can place licence to operate at risk through reputational damage and impaired stakeholder relations.

A number of companies now consider impacts and issues relating to sensitive sites rather than solely protected areas. However, few companies had clearly, publicly defined the scope of this analysis, making it challenging to determine the comprehensiveness of the risk assessments undertaken and therefore the extent to which potential reputational and operational risks were being managed. For all companies corporate-level risk evaluation processes are still evolving. Only six of the 27 companies could demonstrate that risk assessments had been applied at all sites.

Box 6: Example of risk evaluation processes

Lafarge's Presque Isle quarry in the United States partnered with the WWF to measure the value of the biodiversity on site using the Natural Capital project's¹⁰³ Invest model within the World Resources Institute framework for ecosystem services review. The latter was used to identify ecosystem services impacts and dependencies. The Natural Capital project was used to evaluate two scenarios to evaluate the value of the services currently on site and those under development in economic terms.

Statoil is working with the University of Oxford to develop and test the Local Ecological Footprint Tool that can assess the ecological value of land outside protected areas to inform environmental and social impact assessments. This tool considers i) biodiversity, ii) vulnerability, iii) fragmentation, iv) connectivity and v) resilience¹⁰⁴.

Anglo American is using a high-level risk assessment tool that was developed by Fauna & Flora International and considers biodiversity and ecosystem services risks and opportunities at a site level to inform global level understanding of high-risk or opportunity sites. This tool is now helping to inform the development of a simpler, rapid Biodiversity Overlap Assessment (BOA) tool broader scale risk assessment tool which draws from tools such as the Integrated Biodiversity Assessment Toolkit. Following the piloting of the methodology at a small number of sites, the company is embedding its use into its internal Geographic Information System (GIS) to enable an annual evaluation of the proximity of operations to sensitive sites in biodiversity terms and to develop and maintain a global biodiversity risk map that can be used to output to communicate the findings. The company intends to further develop the BOA tool to include extend this to ecosystem services in the risk and opportunity analysis such as land and water in subsequent phases of the analysis, and will update the information on a regular basis. This will be updated on an annual basis.



Identifying ecosystem services risks

Most companies (26 out of 27 surveyed) had some form of risk evaluation in place linked to water and 13 had identified operations in water-stressed locations. An interesting development was the work being undertaken by IPIECA through the World Business Council for Sustainable Development to improve and extend the Global Water Tool to improve its utility for the oil and gas industry and strengthen its coverage of biodiversity issues. See Appendix 1 for further information. The most advanced approaches to water management from an ecosystem services perspective considered the needs of shared users of the water, including wildlife. Few companies were beginning to consider the links between biodiversity, ecosystem services and water management (see Section 6.2.5 for further discussion).

Integration of ecosystem services thinking into climate adaptation

Of the companies that had formed a view on climate risk exposure, four were able to cite examples of actions taken that recognised the role of natural assets such as mangroves or coastal marshes in climate adaptation.



Jason Smalley/naturepl.com

6.2.3 Management & implementation

This section of the benchmark evaluates the extent to which policy commitments related to BES are implemented through the use of management tools such as: environmental and social impact assessments (ESIAs); biodiversity action plans (BAPs) or their equivalent; and the integration of BES into site closure and rehabilitation.

Table 10: Performance against management and implementation benchmark criteria

Criteria		Proportion and (number) of companies			
		Mining		Oil & gas (n=13)	
		2005 n=13	2011 n=14	2005	2011
Biodiversity	Activities underway to manage biodiversity	92% (12)	93% (13)	92% (12)	100% (13)
	Action plans at all high-risk sites	0% (0)	14% (2)	8% (1)	21% (3)

Managing site-level biodiversity risk and opportunity

Almost all companies surveyed (85%) had integrated BES to some extent into ESIAs. However, tools to ensure a consistency of approach throughout the company's operations were rare (four companies).

The extent of site-level biodiversity management is increasing. Twenty-six (out of 27) or 91% of companies showed widespread activity on this issue compared to 11 out of 26 companies (42%) in 2005. Activities ranged from marine mammal surveys, to species translocations and reforestation activities and from philanthropic activities to activities closely tied to mitigation. However, few companies could demonstrate that action plans for BES management were in place for all high-risk sites that comprehensively identified impacts, risks, opportunities and set management actions and targets to address them. For even the companies with the best developed management systems, the process of identifying high-risk areas and implementing risk management measures (whether through site management plans or stand-alone biodiversity action plans) was still underway.

Box 7: Management systems for BES

Holcim has developed a strategic partnership with IUCN. Overseen by an independent panel of experts, the partnership is assisting Holcim in developing and implementing a biodiversity management system that includes:

- A group biodiversity risk matrix, which evaluates site-level risk based on geographic location and nature of the operations. This is used to identify low, medium- and high-risk sites and to prioritise effort;
- Key performance indicators related to BES management, linked to high-risk sites;
- Guidance on site biodiversity management and the terms of reference for environmental and social impact assessments, biodiversity action plans and rapid assessment surveys, which promote consistency of approach at site level.

Managing ecosystem services risk and opportunity

There are relationships between water and biodiversity (and therefore ecosystem services) that must be explicitly managed to avoid perverse impacts on ecosystem services. For example, companies managing water for people's sakes, may fail to address the needs of water for nature. Although activities to minimise consumption of water and ensure appropriate water quality were widespread, it was difficult to determine the extent to which careful management of ecosystem services played a role in such schemes. BG, Shell and ExxonMobil are actively using reed bed filtration and wetland management to assist in water filtration, however, such schemes appear one-off pilots rather than integrated through corporate water management programmes. Some companies, such as BHP Billiton, are beginning to explore the links between site level water management and natural assets in a more systematic manner in conjunction with conservation agencies.

Box 8: Biofuels and BES impacts and dependence

As set out in Section 2, the requirement for blending of biofuels within transport fuel is opening up the oil and gas industry to a new set of reputational and operational risks linked to BES. However, since biofuel blending is mandated in a number of parts of the world and not in others, this element was removed from the broader analysis of BES management to avoid an unfair skew in the results towards companies that were not obliged to use biofuels. The results of the analysis of corporate approaches to BES management within biofuels production and sourcing is summarised here.

Six companies in the survey were involved in primary biofuels, three of these producing biofuels as well as sourcing them. The most mature management systems involved: sustainability clauses in supplier contracts; supplier audits; engagement with suppliers to aid performance improvement; and engagement in multi-stakeholder initiatives such as the Roundtable on Sustainable Biofuels aimed at increasing the sustainability of the industry and setting of targets. **Neste Oil**, for example, undertakes supplier due diligence prior to signing contracts with feedstock suppliers, engages with suppliers to support improvement in practice and undertakes supplier audits to ensure compliance with Neste Oil requirements. Due diligence processes help the company map potential issues.

Two of the six companies studied were still early on in their development of traceability systems. This poses a potential risk if biofuels suppliers are found to be sourcing / producing biofuels from high conservation value areas.

Integration of BES into site closure and rehabilitation

Two thirds of the companies (18 of the 27 surveyed) considered BES to some extent in their closure planning. Strong practice in this area was characterised by the existence of specific standards that reference biodiversity and ecosystem services that are subject to annual review. Strong, stakeholder inclusion closure planning can be key to securing licence to operate.

6.2.4 Reporting

This section of the analysis considers the extent to which the company communicates effectively to stakeholders (with a focus on investors) on the issue of BES through its public disclosures and the extent to which targets are set to drive performance improvement. Lack of targets weakens otherwise strong management systems and policy commitments.

Table 11: Performance against reporting benchmark criteria

Criteria		Proportion and (number) of companies			
		Mining		Oil & gas (n=13)	
		2005 n=13	2011 n=14	2005	2011
Biodiversity	Biodiversity targets in place	15% (2)	57% (8)	15% (2)	54% (7)
	Report on sensitive sites	85% (11)	100% (14)	69% (9)	77% (10)
	Quantitative metrics reported for biodiversity	0% (0)	29% (4)	0% (0)	0% (0)
	Companies scoring more than 50% on overall reporting	-	57% (8)	-	38% (5)

Biodiversity

Corporate reporting on biodiversity remains largely qualitative in nature and indicators are largely process based, reflecting a lack of widely agreed performance metrics. Although management systems are essential to manage risk, stakeholders are increasingly interested in companies demonstrating effective performance and this remains an area of challenge for the issue of BES. Companies that performed well in this section were able to demonstrate a logical flow of information that set out 1) policy, 2) risk evaluation processes, 3) tools in place to identify and manage site-level impacts, 4) targets and performance against them and 5) reporting against existing sector-relevant indicators for biodiversity. Biodiversity rarely fell within the scope of the report verification, hence the quality of data was difficult to determine.

The GRI G3 guidelines for biodiversity were widely used, but companies interpreted the GRI indicators in very different ways, leading to variation in the scope of reporting and the nature of data reported. Cross-comparisons across different companies were difficult based on company disclosures against these indicators.

Although management systems are essential to manage risk, stakeholders are increasingly interested in companies demonstrating effective performance.

Broader ecosystem services

Reporting on the extent to which BES is considered within water management and climate adaption and mitigation programmes was limited, reflecting a lack of reporting guidance in this area.

Box 9: Quantitative indicators for biodiversity (see Appendix 1)

Until recently reporting guidance available to the extractive sectors on biodiversity has been largely descriptive in nature. However, more quantitative metrics are now emerging that have the potential to be more beneficial to the investment community:

- The Cement Sustainability Initiative¹⁰⁵ suggests reporting on the number of active quarries within, containing or adjacent to areas designated for their high biodiversity value and the percentage of sites with high biodiversity value where biodiversity management plans are actively implemented. All three cement companies in the survey reported against these indicators.
- Uptake of the GRI Mining and Minerals Sector Supplement¹⁰⁶ was relatively high. The supplement requires companies to report on the number and percentage of total sites identified as requiring biodiversity management plans and the number (percentage) of those sites with plans in place. A similar supplement is being developed for the oil and gas sector.
- The 2011 IPIECA, American Petroleum Industry and the International Association of Oil and Gas Producers Oil and Gas industry guidance¹⁰⁷ on voluntary sustainability reporting released in 2010 suggests that companies disclose the percentage of biodiversity-sensitive operating areas where biodiversity action plans have been implemented and that they include the criteria used to determine sensitivity. No companies surveyed were reporting against this metric.

Such indicators provide more insight to the status of a company's biodiversity management than the more process-focused metrics required by the broader GRI G3 guidance.



6.2.5 Competitive advantage

This section of the evaluation explores the extent to which companies are: exploring opportunities for creating business value linked to declining BES and developing or applying innovative methodologies for understanding and addressing BES impacts and dependencies. It also considers the extent to which the company has been successful in identifying and managing risks based on the presence or absence of recent fines, controversies and NGO campaigns.

Table 12: Performance against management and implementation benchmark criteria

		Proportion and (number) of companies	
Area of activity		Mining (n=14)	Oil & gas (n=13)
Biodiversity	Engaging in biodiversity offsets	50% (7)	38% (5)
	Piloting ecosystem services tools	29% (4)	38% (5)
	Engaging in NGO partnerships	46% (6)	54% (7)
	Exploring ecosystem services markets	38% (5)	38% (5)

Accessing finance and creating value

Although the study attempted to analyse the extent to which the extractive sector was able to successfully access finance as a result of a proactive stance on BES, this data was not readily available from companies. A number of companies had, however, adjusted their management systems to follow the requirements of the IFC performance standards. One was working to calculate the competitive advantage conferred by a strong policy and strategy commitment to biodiversity conservation, however, this work was in its early stages.

Ten companies were exploring the implications of ecosystem services markets for their business.

Box 10: Forest carbon markets

BP is exploring commercial investments that deliver long-term value for the company, focused on the conservation of land-based carbon, including REDD. BP invested US\$ 5 million in the carbon fund of the Forest Carbon Partnership Facility and has investments in the Green Carbon Fund run by EKO Asset Management Partners, which has a focus on land-based projects in the USA (approximately 80% of these are in the USA and 20% of the projects intend to reduce emissions from deforestation and degradation) and wider ecosystem service markets. This represents an early experimentation with carbon and biodiversity markets that, if successful, will be scaled up.

ExxonMobil is initiating a conservation end-use screening tool to evaluate over 400 surplus properties in the USA for conservation disposition potential. Based on the attributes of each site, certain properties will be identified for further detailed evaluation. Potential end uses for these sites may include conservation easements, direct sale or donation to local land trusts, ecosystem services offsets, conservation banking, or retention and management for wildlife habitat and biodiversity protection / enhancement purposes.

For further reading see:
UNEPFI (2011) Reddy Set Grow

Despite an increase in concern about water scarcity, and growing experimentation at a government level, none of the companies were experimenting with payments for water services, although a number were engaged in schemes linked to water management such as wetland offset and banking schemes.

Protecting value – overlaying an ecosystem services perspective on environmental impact analysis and management

One third of companies surveyed are actively experimenting with tools and approaches to understand and manage impacts on ecosystem services. The initiatives most frequently cited were Business for Social Responsibility's Ecosystem Markets Programme, the World Business Council for Sustainable Development's Corporate Ecosystem Valuation Initiative, the World Resources Institute's Corporate Ecosystem Services Review and InVest from Natural Capital Project. The IPEICA Biodiversity Working Group has developed a number of tools and guidance on ecosystem services that are a valuable starting point for a company wishing to move forward on this issue.

For further reading see:
IPEICA (2011) Ecosystem services guidance: Biodiversity and ecosystem services guide and checklists

A number of factors contribute to tendency for the companies analysed not to consider BES as a potential competitive differentiator: lack of driving regulatory frameworks in many jurisdictions, lack of metrics and methodologies to enable (for example) robust payment for ecosystem services schemes to be developed and lack of consistent investor requirements on BES as a result of variations in perceived materiality of the issue.

Part 7 Conclusions

BES was perceived by many of the companies surveyed as a material issue

Over 80% of companies considered biodiversity to be sufficiently material an issue to make specific reference to it in policy and strategy documents or standards. Most of these were high-level references within broader sustainability or environmental policies. However, 11 of the 27 companies surveyed produced detailed stand-alone policies, strategies or standards on the issue. This represents a significant increase compared to the 2005 survey when five out of the 26 companies surveyed made detailed biodiversity commitments¹⁰⁸. Nonetheless, the business case for corporate action on this issue remains relatively weak.

Commitments to ‘no net loss’ are growing

In 2004 Rio Tinto made an ambitious commitment to “have a net positive impact on biodiversity by minimising the negative impacts of activities and by making appropriate contributions to conservation in the regions in which it operates”. Rio Tinto remains the only company to have made such an ambitious commitment, however, both Xstrata and Barrick commit to causing “no net loss” of biodiversity and a number of companies are exploring the potential for making a similar commitment. Companies making such a commitment see it as a source of competitive advantage. Remaining concerns by some on how such a commitment can be measured or demonstrated, the implications of being shown to fail to meet such a commitment and technical queries over issues such as scope and timescale are being addressed by the growing professionalism of this field and new available tools. For instance, the Business and Biodiversity Offsets Programme (see Appendix 1) will be releasing a draft standard on biodiversity offsets in early 2012 which will enable third party verification and auditing of companies’ biodiversity offsets, addressing how ‘no net loss’ can be measured or demonstrated.

Realisation of the linkages between water, climate change and biodiversity is growing

This evaluation explored the links between biodiversity, ecosystem services and: climate adaptation policies and procedures and water management. A number of companies (in particular Rio Tinto, Anglo American, ExxonMobil, BP, Shell and Eni) are working to integrate BES into water management and climate mitigation and adaptation policies and strategies. These companies also demonstrated pilot projects that were exploring the use of ecosystem services restoration for, for example, coastal protection initiatives or reduction of water filtration costs. The extent to which BES issues were systematically integrated into water and climate management was not clear.



Juan Pablo Moreiras/FFI

Approaches to corporate biodiversity risk evaluation are maturing

All but two of the companies surveyed had some form of corporate-level biodiversity risk evaluation in place. In the first instance these focused on identifying proximity of operations to protected areas, but for over 70% of the companies, this had been extended to consider other areas of high biodiversity value (i.e. sites not legally protected). Companies very rarely defined what they meant by 'high biodiversity value' hence the exact scope of such risk assessments and their utility for identifying all risks was not uniformly clear. A number of companies were taking this risk evaluation further, exploring site-level BES impact and dependence assessment tools and using the learning from these forms of evaluation to inform a broader BES risk assessment process. However, no company had a comprehensive, fully implemented risk evaluation process in place for BES.

Integrated approaches versus embedded approaches

Approaches to site-level biodiversity management varied. Some companies integrate biodiversity into broader management systems, while others produce discrete biodiversity action plans. It is recognised that integration of BES into existing management systems, from corporate risk registers, to site-level operational management plans, is ultimately preferable to having stand-alone management systems that are not effectively integrated into corporate management systems. However, until such time as thinking around BES has matured and indicators to monitor BES have been developed, increased visibility on the management of the issue is reassuring to stakeholders.

Matching BES management activities to risk

In the absence of mature corporate-level risk evaluations and assurance processes, it is challenging to demonstrate that the activities underway to manage BES are commensurate with the company's risk exposure. Those companies that reported the percentage of sites deemed sensitive and the extent to which such sites had biodiversity action plans in place provided a more comprehensive picture of risk management that provided comfort that major risks were being well managed. Only five out of the 27 companies surveyed demonstrated activity to manage biodiversity at all high-risk sites.

Contributions to conservation are being made

The majority of the companies had activities in place that aimed to contribute to biodiversity conservation, whether through one-off contributions to conservation via donations or through ongoing partnerships to build the capacity of conservation organisations and deliver conservation of biodiversity on the ground. Companies in the cement industry in particular emphasised the benefits that the industry can provide to BES through restoration of already degraded land, preventing the degradation of land previously under threat and managing their estates for conservation.

Partnerships with NGOs are used to build capacity

Of the 12 companies scoring highest in the analysis, nine had (either current or historic) strategic long-term, multi-project partnerships that input into corporate strategy and management of BES on the ground. Such partnerships provided: strategic advice on policy and strategy, input into tool design and piloting, input into conservation activities at site level, third party assurance of existing systems or sites and increased capacity through secondments or access to expertise not readily available within the private sector.

Companies are testing ecosystem services tools

Interest and engagement on the development of tools to understand and evaluate impacts and dependence on ecosystem services is high, particularly in the oil and gas sector. A number of companies had engaged in the WBCSD Corporate Ecosystem Valuation Initiative and were in the process of understanding the outcome of that work and its implications for broader environmental and sustainability management within the company. Perspectives from the companies surveyed differed as to the value of an ecosystem services approach to environmental management. Some felt that it transformed thinking (although not radically); others felt it represented business as usual.

Lack of appropriate key performance indicators

Less than 50% of the companies reviewed reported extensively against biodiversity related indicators. This is perhaps unsurprising given the lack of widely agreed performance metrics for BES. Review of the data reported against the GRI indicators shows that the information reported as complying with GRI guidance is highly variable in nature. Sector specific indicators such as those set out by the Cement Sustainability Initiative, the GRI Mining and Metals sector supplement and the draft oil and gas sector supplement (for example on the percentage of sites operating in sensitive areas and the percentage of those sites which have biodiversity action plans in place) offer good steps towards a more quantified approach. However, more could be done to provide companies with guidance on the level of detail and nature of disclosures required to clearly communicate on their management of BES risks and opportunities.

Third party assurance is not widely used on this issue

Only four companies (15%) had third party assurance over some of their BES management systems, although significantly more stated that they had integrated BES into their internal assurance processes. Emerging auditable standards (such as BBOP's draft standard on biodiversity offsets) may help companies integrate BES into their assurance processes.

Experimentation in environmental markets is growing

As may be expected, interest and engagement was highest in those areas of payments for ecosystem services schemes that are most strongly supported by legislation; wetland offsets and banking in the USA and reduction of emissions from deforestation and degradation more broadly.

This section sets out a set of recommendations for companies within the extractive industry, their investors and governments.

Part 8

Recommendations



Stuart Butchart

8.1 For the investment community

Work with stakeholders to identify metrics of BES performance and means by which BES related risks and opportunities can be identified:

Work with governments, NGOs and companies to agree a framework for evaluating BES risk. Collaborate in efforts to develop performance metrics that can evaluate BES management and performance in order to assist companies in increasing the efficacy of their disclosures on and management of BES risk.

Develop a clear policy of recognition and intent in relation to BES:

Make a commitment to comply with the law in local and foreign jurisdictions and to avoid financing companies with high-risk operations in areas containing important biodiversity or ecosystem services and an ongoing poor track record of performance with regards to BES issues.

Build capacity to engage on the issue of BES:

Track relevant initiatives as set out in Appendix 1 and be aware of a changing policy environment. Identify areas of potential risk exposure and opportunity within your investment portfolio and take steps to better understand those risks. Work with extractive companies to identify and encourage adherence to acceptable standards performance set out with investment policies (see Table 3 for guidance).

Identify areas of risk and opportunity within your investment portfolio using tools such as the Ecosystem Services Benchmark:

Environmental externalities have been demonstrated to significantly impact universal investors. Although not all externalities are ecosystem service-related, considering the broad range of ecosystem services can provide a useful way of gaining an insight into some of the potential areas of risk within an investor's portfolio associated with environmental externalities. A starting point for this is the WRI's Corporate Ecosystem Services Review and WBCSD's Corporate Ecosystem Valuation guidance and the Ecosystem Services Benchmark. The ESB can be used to identify those companies that are lagging behind their peers in their understanding and management of BES and thus represent a potential risk. Risk factors to consider are 1) existence of an aggressive exploration policy with a high proportion of assets in areas of high biodiversity / low conservation capacity; 2) lack of knowledge of areas or issues that could be deemed sensitive or high-risk throughout a company's operations; 3) failure to acknowledge potential reputational and regulatory risk associated with mismanagement of impacts on areas of important biodiversity and ecosystem services; 4) failure to implement audited action plans at site level for sites identified as high-risk; and 5) failure to explore the implications of declining BES for business. Opportunities for building brand value and reducing costs may arise as a result of a proactive approach on points 1-5 above, exploration of emerging market mechanisms for ecosystem services and biodiversity conservation, testing of new tools and approaches and contribution to addressing sectoral level barriers to progressing corporate management of the issue.

Engage with companies identified as high risk to encourage performance improvement and seek out evidence of best practice as set out in table 3:

As a minimum, companies should have undertaken a review of potential risk exposure and taken steps to manage that risk.

Work to further embed BES within broader environmental, social and governance analysis:

Use the learning from this to create an analysis and other similar guidance documents to review and update investment procedures and encourage clients to do the same.

8.2 For governments

Ensure the private sector is fully integrated into national biodiversity strategies and action plans and National Ecosystem Assessments

All signatories to the Convention on Biological Diversity have committed to engage the private sector on the implementation of the commitments of the Convention. However, private sector engagement in the development and implementation of National Biodiversity Strategies and Action Plans remains poor. Governments in countries that are rich in mineral reserves or in which a significant proportion of the industry is headquartered, should consider the role of the extractive industry and private sector more broadly in enabling or preventing the attainment of the CBD targets and involve extractive companies in their implementation. Through this process, governments should identify areas of potential conflict between mineral resources and BES and act to safeguard biodiversity by partnering with the members of the sector that demonstrate the most robust performance on this issue.

Strengthen concession permitting processes

Ensure the process for awarding permits and leases for oil and mineral rights is done in a manner that supports the country's commitments under the Convention on Biological Diversity. This should set out requirements for companies to avoid, minimise, mitigate and offset company impacts on ecologically sensitive sites.

Continue to explore means of reflecting the true value of BES in decision-making

Although it is encouraging to see widespread activity on BES within the sector, it is fair to say that many of the companies evaluated are amongst the most active on the issue. The failure to appropriately value BES remains a key barrier to more widespread corporate action in this area. Government action is required on the recommendations of the review of The Economics of Ecosystems and Biodiversity (TEEB), namely to internalise ecosystem services costs that are currently excluded from corporate valuation and decision-making. This is a fundamental first step in ensuring that the issue is addressed. For governments with significant state-owned extractive companies, they should ensure that they follow the recommendations set out in table 3 below.

Strengthen the incentives and abilities for companies to report on BES

To be meaningful, corporate information must be complete, accurate and appropriate, and the indicators used must be both process- and performance-based measures. As investor interest in BES grows and corporate desire to track performance on the issue increases, demand will increase for indicators that are widely reported and comparable. Governments are encouraged to put in place a legal requirement for disclosure of material social and environmental issues, including BES. Such legislation should provide detailed guidance on BES risk (defining when a BES risk becomes material) and on BES indicators, developed in conjunction with companies. The UK government has committed to develop reporting guidance for companies on biodiversity and ecosystem services; initiatives such as this are required to provide more robust, measurable indicators that provide a more accurate picture of corporate performance and risk. However, the utility of such initiatives will be limited unless the appropriate drivers and resources are put in place to support their development, piloting and uptake. The private sector must be centrally involved.

8.3 For companies in the extractive sector

The sector is clearly very engaged on the issue of BES and is working hard to understand and address impacts. Table 3 outlines a best practice approach to understanding and managing this issue, based on practices observed already underway in this sector and others.

Table 3: Best practice approach to BES management

	What do we mean?	Indications of best practice	Tools, guidance and examples (see Appendix 1)
Policy and strategy	Introduce company-wide policy and/or strategy commitments to understand and manage biodiversity and ecosystem services risks and opportunities	<ul style="list-style-type: none"> Board-approved publicly available policy on biodiversity (or reference to biodiversity in board-approved environment or sustainable development policy supported by more detailed policy guidance). This should commit to avoid, minimise and mitigate and offset impact where possible. Integration, or exploration of the potential for integration of BES into policies and strategies on water, climate (adaptation and mitigation) and (where applicable) biofuels production and sourcing. Group-level BES strategy that acts as a framework for implementing policy commitments developed, in conjunction with key stakeholders, and informed by local, regional and national priorities as appropriate, which include credible goals and measurable targets. Ensure equivalent standards of policies and strategies to those outlined above for joint ventures and third parties such as contractors. 	<ul style="list-style-type: none"> Examples of strong policy commitments are shown by Shell, Eni, Anglo American, Rio Tinto, BG, Xstrata, Barrick Gold The CEO Water Mandate WBCSD Guide to Corporate Ecosystem Valuation The Ecosystem Services Benchmark from the Natural Value Initiative
Governance	Processes and resources are in place to undertake a formal risk and opportunity evaluation of impact and dependence on biodiversity and ecosystem services	<ul style="list-style-type: none"> Identify and periodically review the BES risks, impacts and opportunities for contributing to BES associated with all existing and proposed operations, using tools such as the integrated Biodiversity Assessment Tool. This should also be informed by local, regional and national biodiversity priorities and goals identified in National Biodiversity Strategy and Action Plans, national ecosystem assessments and discussions with key stakeholders. Integrate consideration of BES risks and impacts into key decision-making processes and governance structures, particularly early exploration. Ensure that risk evaluations for water, climate and biofuels consider both impact on BES and dependence. Appropriate resources are assigned to managing the issue. 	<ul style="list-style-type: none"> WRI's Corporate Ecosystem Services Review WBCSD Guide to Corporate Ecosystem Valuation IPIECA has multiple sources of guidance e.g. "Ecosystem services guidance: Biodiversity and ecosystem services guide and checklists" and "Key biodiversity questions in the oil and gas life cycle" ICMM's Good Practice Guidance on Mining and Biodiversity The Energy and Biodiversity Initiative
Management and implementation	Tools, training and assurance processes are in place to drive improvement through the company and its suppliers in accordance with policy and strategy commitments	<ul style="list-style-type: none"> Ensure consistency and transparency of integration of BES analysis into Environmental and Social Impact Assessments. Take action to avoid, minimise and mitigate BES risks, including in-kind compensation ("offsets") where appropriate, formalising these activities in audited biodiversity action plans or site management plans that include BES at all sites where there is a significant risk to biodiversity or opportunity to contribute to BES conservation. Develop partnerships with key stakeholders that contribute to BES conservation priorities and corporate strategy. Ensure closure and sale planning includes consideration of BES -related issues Ensure that water management plans consider the role of natural assets e.g. maintenance of natural vegetation in controlling water run-off. <p>Ensure that site climate mitigation plans consider the role of land based carbon and that adaptation plans consider the role of natural vegetation e.g. mangroves.</p>	<ul style="list-style-type: none"> ICMM's Good Practice Guidance on Mining and Biodiversity ICMM's Planning for Integrated Mine Closure IPIECA's "A guide to developing biodiversity action plans for the oil and gas sector" The Energy and Biodiversity Initiative Principles and Criteria from the RSPO, Bonsucro, RTRS and RSB BBOP's draft standard on biodiversity offsets

	What do we mean?	Indications of best practice	Tools, guidance and examples (see Appendix 1)
Reporting	Internal and external reporting processes, targets and indicators are in place for BES, allowing effective communication to stakeholders	<ul style="list-style-type: none"> • Implement company-wide BES information collection and reporting systems with clearly defined target audiences, measure performance, set targets and disclose company performance, with a particular focus on high-risk locations and operations. Set out the location of these operations, including risks and activities to mitigate these. • Use more quantified metrics of corporate risk as recommended by the GRI, IPIECA and Cement Sustainability Initiative e.g. percentage of high-risk sites with biodiversity action plans in place. • Collaborate with regulators and environmental groups to develop metrics for BES performance. 	<ul style="list-style-type: none"> • Global Reporting Initiative G3 guidelines (2006) • GRI Mining and Metals Sector Supplement • GRI Oil and Gas sector supplement (final draft 2011) • Cement Sustainability Initiative Key Performance Indicators on biodiversity • IPIECA, API and OGP Oil and gas industry guidance on voluntary sustainability reporting
Competitive advantage	Value is created or protected through company activity across the whole operational life cycle to ensure sustainable use of biodiversity and ecosystem services e.g. cost-efficiencies, new products and new markets	<ul style="list-style-type: none"> • Review and test emerging tools on ecosystem services impact analysis and valuation e.g. the Corporate Ecosystem Services Review and Ecosystem Valuation Initiative to build a more comprehensive understanding of the potential risks and opportunities associated with BES impacts and dependence. • Explore or develop mechanisms for generating value and minimising operational cost linked to biodiversity and ecosystem services e.g. biodiversity offsets and REDD, ensuring that appropriate safeguards are in place. • Review external BES threats which might compromise positive company performance, reputational gain and competitive advantage. 	<ul style="list-style-type: none"> • REDD+y, Set. Grow from UNEP FI • Building biodiversity based business from IUCN and Shell • TEEB for Business • Business and Biodiversity Offsets Programme • Business for Social Responsibility "A Corporate Manager's Resource Guide to Trading in Air, Climate, Water, and Biodiversity Assets" and "2009 State of Global Ecosystem Services Policy Developments" • Ecosystem Marketplace 'State of the Markets' reports on biodiversity markets, watershed payments and the voluntary carbon markets • WBCSD Guide to Corporate Ecosystem Valuation

Sources: Insight Investment (2004), TEEB for Business (2010)

We recommend that companies adopt this approach where feasible. Companies that are already managing this issue in this way see it as a source of competitive advantage.

8.4 Next steps for the NVI

Each company that was evaluated against the Ecosystem Services Benchmark has received a summary of their results with specific recommendations for actions. These are being used by the investors listed on page 92 and 93, as part of their ongoing engagement process with the companies in which they have an interest. This engagement will encourage action on areas where risks are unmanaged and opportunities unrealised. The study will be widely disseminated and used to build expertise in the finance sector to evaluate BES opportunities and risks within the mining, oil and gas sectors, and to drive integration of these issues into investment decisions. By targeting business schools, understanding of the issue will be built in the financiers of the future. In undertaking work on various sectors on BES management, it has become apparent that a more robust, quantified, business case for managing the issue is required together with a uniformly agreed means by which BES risk and therefore materiality can be measured. In the coming year the NVI will be focusing its attention on that, collaborating with a range of partners to do so.



8.5 Final comment

Despite the best efforts of governments, conservation groups and leading companies, BES are still declining. Research increasingly shows that managing natural assets and threats before they become costly is a means to curb risk exposure while increasing competitiveness in an industry that is expected to grow considerably in the coming years. Equally, failure to do so is a cost to society and to investors.

Many aspects of operation in the extractive industry rely on (or impact on) ecosystem services and biodiversity to some extent. Mismanagement of any aspect of this can impair stakeholder relations and give rise to regulatory, market or operational risk. Companies that are proactively managing their footprint can build brand value and competitive advantage whilst creating opportunities for BES conservation and new market opportunities. If profitability and social responsibility are to be sustained into the future, then so too must ecosystem services and biodiversity. Multi-sectoral partnerships between industry, environmental groups and governments to address some of the significant gaps in terms of tools, risk analysis and metrics will be key to achieving this.

Glossary

Best practice

In this report 'best practice' refers to performance level 4 in the Ecosystem Services Benchmark (ESB). It is created based on observed best practice within the five key performance areas of the ESB combined with ideal performance in this area, thus it does not represent best practice within a single company but rather a composite of best practices and an 'ideal' approach to managing biodiversity and ecosystem services impacts and dependencies.

Biodiversity¹⁰⁹

'Biological diversity' means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems (Article 2, Convention on Biological Diversity).

Biodiversity impacts¹¹⁰

Harmful effects on biodiversity through activities that threaten the abundance, location and viability of biodiversity caused directly (e.g. through habitat loss) or indirectly (e.g. through anthropogenic climate change) by human activities. This report focuses on impacts that may be caused by the operations of extractive companies. Companies' operations may lead to more significant secondary impacts to which other causes, such as government policy and further habitat conversion by people in the area, also contribute. Impact is sometimes also referred to as 'footprint'.

Biodiversity opportunities¹¹¹

Some companies already recognise the potential opportunities presented by support for company operations among staff and other stakeholders, but in faster permit and concession negotiations that produce earlier revenues and considerable savings, as well as the competitive advantage of favoured status as a partner.

Biodiversity risks¹¹²

We use this term to refer to two categories of business risk that extractive companies may face unless they demonstrate high standards with respect to the conservation of biodiversity, and the corresponding business opportunities associated with good practice. The first is the risk that they may face difficulties accessing resources in new sites and capital for new investments, likely through competitive disadvantage relative to others with better practice. The second category of business risk is loss of revenues through incurring liabilities, damage to reputation and increased operating costs. The risks to biodiversity from companies' operations (see 'Biodiversity impacts'), and more broadly the risks to society from the current unprecedented global loss of biodiversity to which companies' operations contribute, are of great importance, but are not what we mean by the term 'biodiversity risk' as used in this report.

Conservation tillage¹¹³

Conservation tillage is a tillage system that creates a suitable soil environment for growing a crop and that conserves soil, water and energy resources mainly through the reduction in the intensity of tillage, and retention of plant residues.

Dependence¹¹⁴

A company depends on an ecosystem service if that service functions as an input or if it enables, enhances, or influences environmental conditions required for successful corporate performance.

Direct Impacts ¹¹⁵	Impacts resulting directly from project activities, and typically limited to the immediate project area.
Ecosystem ¹¹⁶	A dynamic complex of plant, animal, and micro-organism communities and their non-living environment interacting as a functional unit. Examples of ecosystems include deserts, coral reefs, wetlands, rainforests, boreal forests, grasslands, urban parks and cultivated farmlands. Ecosystems can be relatively undisturbed by people, such as virgin rainforests, or can be modified by human activity, such as farmlands.
Ecosystem services ¹¹⁷	The benefits that people obtain from ecosystems. Examples include freshwater, timber, climate regulation, protection from natural hazards, erosion control, and recreation.
Governance ¹¹⁸	The process or set of processes by which a company's board and management regulate and control the company's activities, including the identification, evaluation and management of risk. This report focuses on governance structures for managing BES risk and the company's impact and dependence on BES.
High risk sites	Sites identified as being causes of potential reputational, operational and financial risk as a result of their BES profile. This could include sites that are located in or near protected areas or other ecologically sensitive sites or sites that have been identified as being in areas of high water scarcity.
Impacts ¹¹⁹	A company impacts an ecosystem service if the company affects the quantity or quality of the service.
Indirect impacts ¹²⁰	Impacts triggered by the project's presence e.g. inward migration of people following economic opportunities offered by a mining site.
Market capitalisation	A measurement of corporate size equal to the share price times the number of shares outstanding of a public company.
Natural value ¹²¹	The combined use and existence values of biodiversity, including direct and indirect uses such as the provision of ecosystem services and raw materials for food, healthcare and many other uses, as well as the inherent cultural, spiritual and aesthetic values of biodiversity to society.
Offset ¹²²	Practical conservation activities undertaken with the aim of 'no net loss' of biodiversity in order to 'offset'—or compensate for—unavoidable harm to biodiversity caused by a company's operations. Offset refers to conservation activities undertaken once all attempts have been made to avoid and minimise damage to biodiversity ¹²³ .
Opportunities ¹²⁴	Competitive advantage (monetisation of intangible assets) realised by a company as a result of putting strong practices in place to avoid and minimise impacts on biodiversity and ecosystem services. An example might be securing a significant share of the market for organic produce. Or, guaranteeing product transport routes by managing / protecting the Natural Hazard Regulation ecosystem service.

Performance levels ¹²⁵	Categories of performance assigned by our toolkit which reflect a spectrum of business practice ranging from least formed (Level 1) to best (Level 4) practice. Companies are expected to progress from Level 1 to Level 4.
Policy ¹²⁶	We define policy as a high level aspirational commitment, setting out a company's position on a particular issue.
Prior informed consent	Permission given by the Competent National Authority (CNA) of a country to an individual or institution seeking to obtain access to genetic resources, in line with an appropriate legal and institutional framework.
Sensitive sites ¹²⁷	Sensitive sites include both protected areas and areas not subject to legal protection but which have been identified as having local, regional or national importance as a result of the biodiversity they hold. These include habitats that are a priority for conservation (often defined in National Biodiversity Strategies and Action Plans prepared under the Convention on Biological Diversity) and sites that are valuable for cultural reasons. In addition, several international conservation organisations have identified particular areas of high biodiversity value.
Stakeholders ¹²⁸	A person or group that has an investment, share, or interest—a 'stake'—in the issue at hand or who will be affected by decisions on the issue or can affect corporate performance. Stakeholders in the context of this report are those affected by and/or able to influence an extractive or utility company's BES risks and opportunities. They would typically include local communities, employees, suppliers and shareholders.
Strategy ¹²⁹	A planned course of action intended to best achieve adopted goals, which may be described in a policy. In the context of this report, we use 'strategy' to refer to a document defining the company's vision for desired outcomes on a given issue in the medium term, outlining goals, prioritising them and assigning targets.
The benchmark of 2005 ¹³⁰	A framework created by Insight Investment and Fauna & Flora International to analyse the comparative performance of extractive and utility companies on the management of biodiversity risks and impacts in 2005. It covers 35 issues under 19 headings across the five main elements of governance structures, policy & strategy, management & implementation, assurance & reporting and leadership.

Appendix 1: Initiatives and tools

The table below lists a range of tools and initiatives that are being used by the extractive industry to inform and guide its approach.

Organisation/Initiative	Tools, guidance and support provided
Initiatives or tools of general relevance	
<p>ARIES (Assessment and Research Infrastructure for Ecosystem Services) Project</p> <p>http://ecoinformatics.uvm.edu/aries</p> <p>An ecosystem services assessment, planning and valuation tool.</p>	<p>A computer model designed to provide an infrastructure to support decision-makers by estimating ecosystem services provision and their economic value in a specific area.</p>
<p>Biodiversity in a Good Company</p> <p>http://www.business-and-biodiversity.de</p> <p>Aims to increase engagement of the private sector in the Convention on Biological Diversity.</p>	
<p>Business and Biodiversity Offset Programme</p> <p>http://bbop.forest-trends.org/</p> <p>A partnership between companies, financial institutions, governments and NGOs to explore biodiversity offsets.</p>	<p>Produced a set of principles and handbooks providing guidance on the design and implementation of biodiversity offsets, and case studies. A draft biodiversity offset standard will be launched in 2012.</p>
<p>Business for Social Responsibility (BSR)</p> <p>http://bsr.org/</p> <p>BSR works with its global network of more than 250 member companies to develop sustainable business strategies and solutions.</p>	<p>BSR Ecosystem Services, Tools & Markets Working Group: Works with tool developers to discuss emerging trends; corporate piloting of tools; tracks global BES policy developments.</p> <p>BSR Ecosystems Markets Initiative: Assists companies in the integration of BES into corporate decision-making, risk assessment and supply chain management.</p>
<p>Cambridge Programme for Sustainable Leadership</p> <p>http://www.cpsl.cam.ac.uk/</p> <p>Part of the University of Cambridge. Works with leaders from business, government and civil society to address the critical challenges for organisations.</p>	<p>Developed the Natural Capital Programme to explore aspects of natural capital, including building the business case, risk assessment and managing natural capital through the supply chain and investment value chain.</p>
<p>Convention on Biological Diversity – Business and Biodiversity Initiative</p> <p>http://www.cbd.int/business/</p> <p>An initiative to engage the business community in the implementation of the CBD objectives.</p>	<p>Provides an overview of existing tools and mechanisms, and a compilation of case studies from companies that have shown best practice.</p>
<p>The EU Business @ Biodiversity Platform</p> <p>http://ec.europa.eu/environment/biodiversity/business/index_en.html</p> <p>A facility within the European Commission's Initiative designed so businesses can come together to share their experiences and best practices, learn from their peers, and voice their needs and concerns to the European Commission.</p>	<p>Provides specific guidance on methodologies, publications, case studies and tools by sector to better tackle business and biodiversity issues.</p>

Organisation/Initiative	Tools, guidance and support provided
<p>Global Reporting Initiative (GRI)</p> <p>http://www.globalreporting.org</p> <p>Network-based organisation that has developed the world's most widely used framework for sustainability reporting.</p>	<ul style="list-style-type: none"> • Global Reporting Initiative G3.1 Guidelines • GRI Mining and Metals Sector Supplement • GRI Oil and Gas Sector Supplement (expected launch date December 2011) • GRI report "Approach for reporting on ecosystem services: Incorporating ecosystem services into an organization's performance disclosure"
<p>Integrated biodiversity assessment toolkit</p> <p>https://www.ibatforbusiness.org/</p> <p>Helps businesses understand the tools and partnerships needed to better manage their natural assets.</p>	<p>Provides GIS / location specific information on terrestrial and marine protected areas, key biodiversity and bird areas, hotspots etc. Reports produced to support specific needs (e.g. risk assessment).</p>
<p>Multi-scale Integrated Models of Ecosystem Services (MIMES)</p> <p>http://www.uvm.edu/giee/mimes/</p> <p>A tool for ecosystem services assessment, planning and valuation</p>	<p>A multi-scale, integrated suite of models that assesses the true value of ecosystem services, their linkages to human welfare, and how their function and value may change under various management scenarios.</p>
<p>Proteus</p> <p>http://www.proteuspartners.org/</p> <p>A partnership between businesses and UNEP World Conservation Monitoring Centre (UNEP-WCMC) to make available global information on biodiversity.</p>	<p>Proteus aims to improve the accuracy of information available on protected areas, by providing access to information on sites important for biodiversity, and increasing access to information on the distribution and status of coastal and marine ecosystems.</p>
<p>Wildlife Trust Biodiversity Benchmark</p> <p>http://www.wildlifetrusts.org/biodiversitybenchmark</p> <p>Provides independent verification of planning and implementation of land management practices.</p>	<p>Can operate as a stand-alone system, or complement existing environmental management systems such as ISO14001 and EMAS. It assesses an organisation's performance in relation to its landholdings.</p>
<p>World Business Council for Sustainable Development</p> <p>http://www.wbcsd.org/</p> <p>CEO led, global association of companies dealing with business and sustainable development.</p>	<p>Guide to Corporate Ecosystem Valuation: Allows businesses to integrate ecosystem values into their accounting systems.</p> <p>Global Water Tool: Maps company water use and assesses risks relative to their global operations and supply chains.</p> <p>WBCSD Cement Sustainability Initiative: A collaboration of 23 cement producers for the pursuit of sustainable development, has produced a number of guidance documents e.g.: <ul style="list-style-type: none"> • Cement Sustainability Initiative ESIA guidance; • Cement Sustainability Initiative Key Performance Indicators on biodiversity. </p>
<p>The World Resources Institute Mainstreaming Ecosystem Services Initiative (MESI)</p> <p>http://www.wri.org/project/mainstreaming-ecosystem-services</p> <p>Aims to provide decision-makers with information and assessment tools that link ecosystem health with the attainment of economic and social goals; and develop new markets, economic incentives, and public policies that restore and sustain ecosystems.</p>	<p>Corporate Ecosystem Services Review Tool A series of questions that helps managers develop strategies to manage risks and opportunities arising from a company's dependence on ecosystems.</p>

Organisation/Initiative	Tools, guidance and support provided
Initiatives or tools of relevance to the oil and gas industry	
<p>The Energy and Biodiversity Initiative</p> <p>http://www.theebi.org/</p> <p>A partnership between energy companies and conservation organisations.</p>	<p>Created a set of practical guidelines and tools to minimise impacts on biodiversity and maximise contributions to conservation e.g.</p> <ul style="list-style-type: none"> • Integrating biodiversity into environmental management systems; • Integrating biodiversity into Environmental and Social Impact Assessment (ESIA) processes; • Framework for integrating biodiversity into site selection; • Biodiversity indicators for monitoring impacts and conservation actions; <p>Discussion papers:</p> <ul style="list-style-type: none"> • Negative secondary impacts from oil and gas development; • Opportunities for benefiting biodiversity conservation.
<p>The Environmental, Social and Health Risk and Impact Management Process (e-SHRIMP)</p> <p>http://www.ogp.org.uk/pubs/413.pdf</p> <p>Developed by the International Association of Oil & Gas Producers (OGP).</p>	<p>e-SHRIMP provides information on the overall timing of environmental, social and community health considerations during planning of oil and gas activities.</p>
<p>IPIECA</p> <p>http://www.iecea.org/</p> <p>The global oil and gas industry association for environmental and social issues.</p>	<p>IPIECA Biodiversity Working Group:</p> <p>Working to increase awareness of biodiversity issues, encourage good practices and develop industry guidance.</p> <p>Guides:</p> <ul style="list-style-type: none"> • IPIECA, API and OGP Oil and gas industry guidance on voluntary sustainability reporting; • A guide to developing biodiversity action plans for the oil and gas sector; • Key biodiversity questions in the oil and gas life cycle; • IPIECA Ecosystem Services Guidance; • Biofuel, Sustainability and the Petroleum Industry • The Oil and Gas Industry: Operating In Sensitive Environments • An Ecosystem Approach to Oil and Gas Industry Biodiversity Conservation • A Guide to the Convention on Biological Diversity for the Oil and Gas Industry
<p>International Association of Oil and Gas Producers (OGP): E&P Sound & Marine Life Joint industry Programme (JIP)</p> <p>http://www.soundandmarinelife.org/</p> <p>Looks into the effects of sound generated by the offshore E&P industry on marine life.</p>	<p>The overarching objective of the JIP is to identify specific, operationally focused questions that relate to the effects of sound generated by the offshore E & P industry on marine life, and to pursue a research programme that will test scientific hypotheses and produce the data needed to address these questions.</p>
Initiatives or tools of relevance to the mining sector	
<p>The International Council on Mining and Metals (ICMM)</p> <p>http://www.icmm.com/</p> <p>The International Council on Mining and Metals (ICMM) was established in 2001 to improve sustainable development performance in the mining and metals industry.</p>	<p>ICMM Environmental Stewardship Group</p> <p>Identifies and advocates the use of best practices to address sustainable development issues:</p> <ul style="list-style-type: none"> • ICMM's Sustainable Development Framework; • ICMM's Good Practice Guidance on Mining and Biodiversity; • ICMM's Planning for Integrated Mine Closure.
<p>IUCN-ICMM Dialogue</p> <p>http://www.iucn.org/about/work/programmes/business/bbp_our_work/bbp_mining/</p> <p>The IUCN and the ICMM have been engaged in an ongoing dialogue on mining and biodiversity since 2002.</p>	<p>The overarching aims of the Dialogue are to improve performance and raise awareness and understanding of the mining industries in the area of biodiversity conservation.</p>

Organisation/Initiative	Tools, guidance and support provided
<p>Post-Mining Alliance</p> <p>http://www.postmining.org/</p> <p>An independent, not-for-profit group working to encourage and promote the regeneration of old mine sites for the sustainable benefit of the local community and natural environment.</p>	<p>Provides a brokering role for civil society groups to engage more actively in post-mining regeneration activities. Participating in a review of the Environmental Resources Management (ERM) toolkit on regulatory, institutional and fiscal frameworks for decommissioning in the mining and oil and gas sectors.</p>
<p>Responsible Jewellery Council</p> <p>http://www.responsiblejewellery.com/</p> <p>An international not-for-profit organisation bringing together over 300 member companies across the jewellery supply chain.</p>	<p>Principles and codes of practice on environmental performance, including biodiversity.</p>
<p>SERA (Socially and Environmentally Responsible Aggregates)</p> <p>http://www.seracanada.ca/</p> <p>An NGO that aims to create, administer and promote widespread support for certification of responsibly sourced construction materials, with a focus on responsibly sourced aggregates.</p>	<p>SERA Standards offer a practical way to extract aggregate materials while meeting the social and environmental expectations of stakeholders. Performance Indicators will be developed in 2012. Principle 5 within the standards specifically addresses the restoration of biodiversity.</p>
Biofuels related initiatives or tools	
<p>Better Sugarcane Initiative (Bonsucro)</p> <p>http://www.bettersugarcane.org/</p> <p>A global multi-stakeholder non-profit initiative dedicated to reducing the environmental and social impacts of sugar cane production.</p>	<p>Provides standards and a certification scheme (with specific reference to biodiversity) that enables farmers to produce sustainable sugar.</p>
<p>Roundtable on Responsible Soy Association</p> <p>http://www.responsiblesoy.org/</p> <p>Is a multi-stakeholder initiative which aims to facilitate a global dialogue on soy production that is economically viable, socially equitable and environmentally sound.</p>	<p>They have developed The Roundtable on Responsible Soy Standard for Responsible Soy Production. The standard applies to all kinds of soybeans, including conventionally grown, organic, and genetically modified (GM). It has been designed to be used for all scales of soy production and in all the countries where soy is produced.</p>
<p>Roundtable on Sustainable Biofuel</p> <p>http://cgse.epfl.ch/page65660.html</p> <p>Coordinated by the Energy Centre at EPFL in Lausanne, bringing together farmers, companies, NGOs, experts, governments, and IGOs to ensure the sustainability of biofuels production and processing.</p>	<p>The RSB has developed a third party certification system for biofuels sustainability standards, encompassing environmental, social and economic principles and criteria through an open, transparent, and multi-stakeholder process.</p>
<p>Roundtable on Sustainable Palm Oil</p> <p>http://rspo.org/</p> <p>RSPO unites oil palm producers, palm oil processors or traders, consumer goods manufacturers, retailers, banks and investors, environmental or nature conservation NGOs and social or developmental NGOs to develop and implement global standards for sustainable palm oil.</p>	<p>The RSPO has developed a site and supply chain certification scheme and a biodiversity working group is in place to address issues such as biodiversity assessment methodologies, compensation schemes and set aside.</p>

Appendix 2: Benchmarking methodology

The Ecosystem Services Benchmark (ESB) was developed in 2007 following consultation with a range of stakeholders including academics, industry and civil society. This methodology was used as a basis for this analysis, but adjusted for application to the extractive sector. The detailed methodology is provided in Table 13. The methodology above draws from a range of materials including (but not limited to): the Global Reporting Initiative, Corporate Ecosystem Services Review (WRI, 2008), ISO 14001; ICMM Good Practice Guidance, IPIECA Oil and Gas Industry Reporting Guidance, GRI g3, mining and metal sector supplement, the draft oil and gas sector supplement and the International Finance Corporation (IFC) Performance Standard 6 (IFC, 2006). It was adjusted with limited consultation with members of IPIECA and the mining industry.

Weighting the categories

Some elements of the benchmark play a greater role in risk management and realising opportunities than others. The relative scores of each section have therefore been adjusted as shown in the table below in order to calculate the final score and level of performance.

Category	Weighting factor
Competitive advantage	15%
Governance	20%
Policy and strategy	20%
Management and implementation	25%
Reporting	20%

Limitations of the analysis

The analysis is recognised to have a number of limitations:

- **Focus on process metrics:** the lack of widely agreed performance metrics for this issue meant that process-based metrics had to be relied upon as proxies for performance metrics, rather than performance metrics themselves. Hence, the benchmark is a measure of management quality as a proxy for actual BES performance;
- **Measurement of management rather than risk:** getting a clear picture of the company's risk profile is challenging, hence rather than evaluating risk itself this analysis looks at the quality of corporate risk management systems;
- **Lack of verification:** the approach relies heavily on corporate disclosures, very few of which are verified;
- **Engagement bias:** companies that engaged with the review performed better in the analysis, frequently providing additional information that would increase their score. Hence companies that did not engage may have understated performance. Language issues may have resulted in reduced scores for companies which speak English as a foreign language;
- **Integration:** the analysis pulls out a single issue when the reality of business operation requires tradeoffs between multiple issues. Until such time as existing management systems encompass this issue, this is arguably justified;
- **Objectivity:** regardless of the structure of the benchmark, it is inevitable that some subjectivity is overlaid on the findings;
- **Competitive advantage:** criteria for defining how a company derives competitive advantage from proactive management of BES are still emerging. In effect this section represents a 'leadership' position, identifying those actions that the most proactive companies are taking on this issue. The assumption made is that such actions will confer competitive advantage.

Table 13: The detailed Ecosystem Services Benchmark methodology

ACTIVITY	LEVEL OF PERFORMANCE
1. Policy & Strategy (Weighting = 20%)	
1.1 Policy and strategy framework: Statement of policy and strategic objectives with relation to biodiversity is in place	<p>Level 1: No specific policy statement</p> <p>Level 2: Issues covered in general terms / at very high level as part of overall environment / sustainable development strategy</p> <p>Level 3: Specific reference to biodiversity and ecosystem services in policy or strategy document</p> <p>Level 4: Comprehensive policy and strategy commitment</p>
1.1a Sensitive sites: Commitment to understand and manage impact on ecologically sensitive sites (see glossary)	<p>Level 1: No commitment made to understand or manage impact on sensitive sites</p> <p>Level 2: Commitment to review all operations to determine which contain, are in or near protected areas</p> <p>Level 3: Commitment to review all operations to determine which contain, are in or near areas of high biodiversity and/ or important ecosystem services (legally protected or otherwise)</p> <p>Level 4: As for 2 and 3 but with evidence given</p>
1.1b No net loss: Commitment to no net loss of biodiversity	<p>Level 1: No commitment made to ensure no net loss of biodiversity</p> <p>Level 2: Commitment made to no net loss of biodiversity, but no evidence of a strategy for implementation</p> <p>Level 3: Commitment made to no net loss of biodiversity with a strategy to enable the commitment to be met (strategy should set time frame, include stakeholder consultation and metrics)</p> <p>Level 4: As for 2 and 3 but with evidence given</p>
1.2 Statement of policy and strategic objectives with relation to water	<p>Level 1: No specific policy statement</p> <p>Level 2: Issues covered in general terms / at very high level as part of overall environment / sustainable development strategy</p> <p>Level 3: Specific reference to water in policy or strategy documents and this statement is consistent with stated commitments on biodiversity and ecosystem services</p> <p>Level 4: Comprehensive policy and strategy commitment which makes reference to ecosystem services</p>
1.3 Third parties: Commitment to influence joint ventures, suppliers and contractors to manage biodiversity and ecosystem services risks to company standards	<p>Level 1: Company policies with regard to performance of suppliers, joint ventures and contractors are not clear</p> <p>Level 2: Company policies are clear with regard to performance of at least one of the following: suppliers, joint ventures and contractors</p> <p>Level 3: Company policies are clear with regard to performance of all of the following: suppliers, joint ventures and contractors</p> <p>Level 4: As for 3, company can provide evidence of implementation of policy commitments</p>
2. Governance (Weighting = 20%)	
2.1 Responsibility: Resources are assigned to ensure effective management of risks and opportunities	<p>Level 1: Not clearly assigned</p> <p>Level 2: Named manager at group level</p> <p>Level 3: As for 2, but manager no more than two levels from board</p> <p>Level 4: Board responsibility rests with named member of executive board</p>
2.2a Corporate level risk assessment – biodiversity: Implications of key biodiversity impacts and issues have been considered within the life cycle of own operations	<p>Level 1: Risk assessment in place but does not explicitly consider biodiversity</p> <p>Level 2: Risk assessment in place but incomplete e.g. only addresses a few sites, or considers protected areas only</p> <p>Level 3: Comprehensive risk assessment in place that considers potential impacts on biodiversity for all sites / operations, including consideration of cultural values</p> <p>Level 4: As for 3 but with evidence of an action plan to mitigate all risks identified by the company as priority</p>
2.2b Corporate level risk assessment – water: The role of ecosystem services has been considered within water management planning	<p>Level 1: Risk assessment in place but does not explicitly address BES</p> <p>Level 2: Risk assessment that considers role of BES in place but incomplete e.g. only addresses a few sites, fails to consider broader trends in water consumption and scarcity</p> <p>Level 3: Comprehensive risk assessment in place that considers key dependencies and impacts i.e. includes considerations of ecosystem services issues</p> <p>Level 4: As for 3 but with evidence of an action plan to mitigate all risks identified by the company as priority</p>
2.2c Corporate level risk assessment – climate: The role of ecosystem services has been considered within climate adaptation planning	<p>Level 1: Risk assessment in place but does not explicitly address the role of ecosystem services</p> <p>Level 2: Risk assessment in place but incomplete</p> <p>Level 3: Risk assessment in place for all sites</p> <p>Level 4: As for 3 but with evidence of an action plan to mitigate all risks identified by the company as priority</p>

ACTIVITY	LEVEL OF PERFORMANCE
<p>2.3 Stakeholder engagement: Processes in place for engagement with external stakeholders to address BES</p>	<p>Level 1: No consultation with external stakeholders on corporate-level BES risks Level 2: Stakeholder consultation on ad hoc basis Level 3: Formal risk- and opportunity-based stakeholder engagement process in place with results used to inform activities at corporate level Level 4: As for 3, plus participation in collaborative stakeholder groups in addition to having a formal stakeholder engagement process in place. Results integrated into a fuller corporate-level risk assessment and associated action plan</p>
<p>2.4 Corporate culture: Strength of culture to operate in accordance with robust environmental procedures</p> <p>Note: there is no level four for this activity</p>	<p>Level 1: No evidence Level 2: Key areas of performance of relevance to BES show positive trends. This should include at least two of the following: spills, CO2 emissions, fines, health and safety (water quality and biodiversity are covered in the reporting section) Level 3: Key areas of performance of relevance to BES show positive trends. This should include spills, CO2 emissions, fines, health and safety (water quality and biodiversity are covered in the reporting section)</p>
<p>3. Management & implementation (Weighting = 25%)</p>	
<p>3.1 Exploration and development: Integrated environmental, social and, as appropriate, health assessments include BES considerations for any new capital project and any substantial modification of existing projects</p>	<p>Level 1: No mention of biodiversity and ecosystem services in relation to exploration, development and expansion Level 2: Biodiversity and ecosystem services integrated into environmental impact assessments / environmental and social impact assessments and consider both direct and indirect impacts Level 3: Evidence of review of biodiversity and ecosystem services impacts and dependencies at the earliest stage of exploration and development / expansion Level 4: Evidence of tools / systems that ensure consistent consideration of BES throughout exploration and development / expansion of sites</p>
<p>3.2 Biodiversity management at site: Biodiversity management at site either as an integrated site management plan or as a stand-alone biodiversity action plan</p>	<p>Level 1: Site plan does not include biodiversity and ecosystem services Level 2: Some sites have plans which integrate biodiversity and ecosystem services issues Level 3: Biodiversity and ecosystem services are integrated into all site-level plans where significant impact or risk of significant impact identified Level 4: As for 3, but implementation is audited</p>
<p>3.3 Water management: Ecosystem services are considered within water management activities</p>	<p>Level 1: Minimal activities in place to reduce water footprint Level 2: Activities in place to address water consumption or quality, but not clearly linked to risk or risk evaluation fails to consider water dependencies of other users and stakeholders and BES Level 3: Series of projects flowing out of an analysis of areas of water scarcity and risk which includes consideration of water dependencies of other users and BES. Stakeholder needs are understood and integrated into the water management at all sites where risks have been identified Level 4: As for 3 plus audits conducted to ensure performance is improved</p>
<p>3.4 Site closure, sale and rehabilitation: Safeguards written into closure and sale agreements to ensure company is not exposed to reputational risk with regards to BES</p>	<p>Level 1: No evidence of understanding of the risks associated with sale and closure Level 2: Processes incorporate post-closure planning and assignment of biodiversity risk management responsibilities and tools exist to support this Level 3: As for 2, and there are provisions to ensure sustainability of mitigation / rehabilitation actions on sale or closure e.g. sustainable financing mechanisms Level 4: Process is reviewed throughout the life of the mine and evidence of ongoing rehabilitation provided</p>

ACTIVITY	LEVEL OF PERFORMANCE
4. Reporting (Weighting = 20%)	
4.1-3 Quantitative Targets I: targets have been set to drive forward policy and strategy implementation (water and biodiversity)	<p>Level 1: No targets set</p> <p>Level 2: Targets in place at one of either site level or corporate level</p> <p>Level 3: Targets in place at both site level and corporate level</p> <p>Level 4: Targets in place and evidence of improvement</p>
4.2 Reporting: Effectiveness of public disclosures in communicating risk exposure and potential opportunities associated with BES	<p>Level 1: Brief mention; no detail</p> <p>Level 2: Discussion of issues; stories; no reporting on results or targets, some communication on priority areas and limited reporting on results or targets</p> <p>Level 3: Detailed disclosure of areas of biodiversity and ecosystem services risks, actions to address them, goals and targets. Disclosures in accordance with the GRI mining and mineral sector supplement</p> <p>Level 4: As for 3, but reported data is verified by a third party verifier</p>
4.3 Sensitive sites: Disclosure of key operations in ecologically sensitive areas / sites or adjacent thereto (biodiversity)	<p>Level 1: No disclosure of sites which contain, are in or near sensitive sites</p> <p>Level 2: Information is disclosed for some operations which contain, are in or near sensitive sites or a commitment made to identify sensitive sites</p> <p>Level 3: Name and location of sites are given together with a brief description of potential impact on sensitive sites and the process by which the sites were identified</p> <p>Level 4: Name and location of site are given together with a brief description of potential impact on sensitive sites and mitigatory actions and the process through which the sites were identified</p>
4.4 Water risk: Disclosure of key operations in areas of water sensitivity	<p>Level 1: No disclosure of sites</p> <p>Level 2: Information is disclosed for some operations but is incomplete for the business</p> <p>Level 3: Name and location of site are given together with a brief description of the issue</p> <p>Level 4: Name and location of site are given together with water scarce areas and mitigatory actions and the process through which the sites were identified</p>
5. Competitive advantage (Weighting = 15%)	
5.1 Revenue opportunities: Opportunities for creating business value linked to declining BES are being explored in the context of ecosystem services values of the land held by the company	<p>Level 1: No activities in place</p> <p>Level 2: Evaluation of potential market opportunities linked to the ecosystem services value of landholdings is underway</p> <p>Level 3: Evaluation of potential opportunities complete and strategy to realise opportunities developed</p> <p>Level 4: Pilot projects developed to test potential market opportunities</p>
5.2 Innovation: Development / application of innovative methodologies for understanding and addressing BES impacts and opportunities Note: there is no level four for this activity	<p>Level 1: No activities in place</p> <p>Level 2: Exploration of innovative mechanisms and tools e.g. biodiversity offsets, engagement in initiatives such as the WBCSD Ecosystem Valuation Initiative or Corporate Ecosystem Service Review or through undertaking product life cycle analysis and creating low impact products</p> <p>Level 3: Pilot projects developed to explore innovative mechanisms and tools such as biodiversity offsets</p>
5.3 Ensuring sustainability of supply and operating conditions: Measures are being developed to reduce demands placed on or to restore shared or declining ecosystem services on which the company is dependent	<p>Level 1: No activities in place, or just ad hoc public relations-based investments</p> <p>Level 2: Activities in place, but engagement is ad hoc and issues driven rather than linked to strategy</p> <p>Level 3: Pilot projects to reduce impact / dependence on biodiversity and ecosystem services developed to generate data for potential company roll-out; wider action plan developed to address key issues</p> <p>Level 4: Series of activities in place to address priority areas of risk</p>
5.4 Reputational risk: Evidence of stakeholder concern regarding company activities and BES	<p>Level 1: Company has undergone law suit or is subject to legal proceedings regarding impacts / issues relating to biodiversity and ecosystem services in the last two years</p> <p>Level 2: Company subject to campaigns or has experienced a high profile incident in last two years</p> <p>Level 3: Company subject to NGO campaigns regarding one or more sites or activities in the last two years</p> <p>Level 4: No evidence of stakeholder concern in the last two years</p>

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Steering Committee

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