

Is biodiversity a material risk for companies?

An assessment of the exposure of FTSE sectors to biodiversity risk

September 2004

ISIS Asset Management

ISIS Asset Management is a UK-based asset manager with £62.6 billion of funds under management (as at 31-08-04). As an investor, we believe that companies that manage their social, environmental and ethical risks effectively are protecting shareholder value. ISIS regularly publishes research studies with a view to encouraging more socially responsible behaviour by companies, as we believe that active participation in such debates by investors can help lead to better risk management by companies. This report forms part of ISIS's on-going Biodiversity Programme. With effect from October 2004, ISIS will merge with F&C Management Ltd to create the UK's fourth largest fund manager. The combined company will operate under the name F&C Asset Management Plc.

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Earthwatch Institute (Europe)

The research for this report has been undertaken by Earthwatch Institute (Europe) and ISIS Asset Management. Earthwatch is an international environmental organisation. Its mission is to engage people worldwide in scientific field research and education to promote the understanding and action necessary for a sustainable environment. Earthwatch works closely with the private sector on a range of programmes designed to enable Earthwatch to deliver this mission. A number of these are focused on biodiversity and this report is an important contribution to this work programme. Earthwatch would like to acknowledge the support of DEFRA to the Earthwatch Business and Biodiversity Resource Centre (www.businessandbiodiversity.org), to which this report will also contribute.

Department for International Development

We would like to thank the Department for International Development (DFID) for supporting this work. DFID is the UK Government department responsible for promoting sustainable development and reducing poverty. The central focus of the Government's policy, based on the 1997 and 2000 White Papers on International Development, is a commitment to the internationally agreed Millennium Development Goals, to be achieved by 2015 (www.un.org/millennium/summit.htm).

DFID works in partnership with governments committed to these Goals, with civil society, the private sector and the research community. It also works with multilateral institutions, including the World Bank, United Nations agencies, and the European Commission.

By highlighting the potential risks and opportunities of biodiversity-related impacts on shareholder value this project should promote the integration of biodiversity issues into market, investment and boardroom considerations, and see companies more fully embrace sustainability. A sustainable and diverse natural environment is important to poor people - who rely heavily on access to a range of natural resources and ecosystem services for their livelihoods - and thus has a role to play in poverty reduction. DFID is committed to making biodiversity work for the poor.

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Opinions expressed in this report are those of ISIS Asset Management, except where specifically attributed to others.

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Biodiversity is an issue of global importance; it lies at the core of sustainable development, and yet it remains difficult to measure and its relationship with the corporate sector is often poorly understood. Most people will agree, however, that we are all dependent on the diversity of life - from the range of plants and animals used for food and shelter, to the variety of forests and ecosystems protecting water supplies and providing other vital services. It is fair to say that biodiversity is an essential component in the sustainability of all human activity, including business, and therefore has an important impact on human quality of life.

Many businesses have an impact on biodiversity globally, either directly or indirectly through their supply chains. While some of these companies have identified biodiversity as an important issue, others have a poor understanding of the significance of the business risks associated with biodiversity loss and ecosystem degradation. Significantly, there is increasing evidence that environmental and related issues affect long-term shareholder value, and that in some cases those effects may be acute.

In addition to broader financial and economic factors, a wide range of environmental, social and corporate governance issues can contribute to the risks and opportunities faced by business and, in turn, affect shareholder value. Among this range of issues is biodiversity. Unless a company can demonstrate high standards with respect to biodiversity, its position in the marketplace, even its profitability, can be threatened by risks such as challenges to its legal license to operate, disruption to the supply chain, as well as liabilities, damage to reputation and increased operating costs. If properly managed on the other hand, perceived biodiversity risks can be turned into mutually beneficial opportunities for both business and biodiversity. Indeed, safeguarding shareholder value and natural value are not mutually exclusive - they are interdependent.

Long-term protection of shareholder value therefore rests, in part, upon rigorous integration of environmental issues into financial analysis and investment considerations. To this end, an increasing number of institutional investors are becoming interested in approaches to asset management that explicitly include environmental (including biodiversity-related) criteria where they are or may become relevant to investment performance. Investors, using their expertise in risk assessment, are also seeking to stimulate companies to raise such issues up their list of priorities.

This report sets out our work to improve the business community's understanding of the risks and opportunities presented by biodiversity. We hope that companies will see from this report the benefit of managing biodiversity in a more systematic and sustainable manner, of setting clear minimum standards for biodiversity management, and of moving towards good practice. Doing so will protect shareholder value, as well as the natural and economic value represented by biodiversity.

A handwritten signature in black ink, appearing to read 'Karina Litvack'.

Karina Litvack

Director, Head of Governance
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1. Executive Summary

1.1 Overview

Over the past decade, global loss of biodiversity, and the consequent economic value of 'ecosystem services', has been rising up the public policy agenda. We have now reached a point at which increased scientific understanding of biodiversity loss, combined with greater analysis of its causes and potential impacts, has caused the relationship of the corporate sector with biodiversity to come under scrutiny.

Investor attention to biodiversity has - to date - primarily focussed on the extractive industries and utilities, on the assumption that these are the sectors for which biodiversity risks are most likely to be material.

However, an increasing number of companies, in a widening range of sectors, are considering and reporting on their biodiversity impacts and associated risks. Indeed, there is growing evidence to suggest that biodiversity risks are relevant to companies in other sectors. This report examines the nature of the relationship between biodiversity and business, the specific sectors and risks involved, and whether the risks are material.

The results of this report are based on a survey of 29 professionals familiar with the relationship between business and biodiversity, interviews with nine companies, and extensive analysis of other available indicators of sector-level biodiversity risks and management of those risks. The report has been researched and written by ISIS Asset Management and Earthwatch, with the support of the UK's Department for International Development (DFID).

1.2 Objectives of this report

The overall aim of this report is to answer the question 'is biodiversity a material risk for companies?' and to identify which sectors are most likely to be exposed to such risks.

The report's specific objectives are:

- To identify the business sectors in which the relationship between companies and biodiversity is most likely to lead to material risks.
- To identify sources of risk related to biodiversity that businesses need to take into account as part of their planning and management processes.
- To identify which sectors and companies are most at risk due to lack of awareness and management of biodiversity issues.
- To provide recommendations for action by companies – especially concerning the need for consideration of biodiversity in a company's Operating and Financial Review.

1.3 What is biodiversity?

Biodiversity is the term used by the scientific community to describe the number of species and genetic variety within species. The term has also become short-hand for policy makers and conservationists to describe the importance of ecosystems – i.e. the environment or habitats created by many species interacting – and the efforts made to conserve ecosystems. In many ways, it is therefore an unhelpful term, as it covers a multitude of issues relating to ecosystem services and ecosystem management, as well as its pure sense of species diversity. This gives considerable scope for confusion.

We use the term in this report because it has been widely used by policy makers – for example in the title 'Convention on Biological Diversity' and the 'UK Biodiversity Action Plan' – but we recognise that our focus, and the relevance of biodiversity to most companies, is in the wider sense of ecosystem services, management and conservation.

The value of biodiversity to many companies does not usually relate to the existence of individual species per se. Rather, it is the economic value of natural or 'ecosystem' services that are sustained through the complex simultaneous interaction between many species that has long been integral to economic success, and is now at risk from growing biodiversity loss. There is a wide range of such ecosystem services on which people, companies and the global economy rely. The total global value of ecosystem services has been estimated at \$33 trillion per annum,¹ and examples of ecosystem services are: natural purification of water supplies and creation of drainage systems; moderation of floods, droughts and temperature extremes; generation and renewal of soil fertility; prevention of soil erosion and nutrient cycling.

¹ The value of the world's ecosystem services and natural capital [Constanza et al, Nature 387, 1997, pp 253-259].

1.4 The relationship between business and biodiversity

- Companies have a two-way relationship with biodiversity, encompassing both the impact of companies on biodiversity, and the impact of biodiversity on companies.
- Companies can have both direct and indirect impacts on biodiversity.
- Some companies are dependent on biodiversity, in the form of natural products or ecosystem services. This makes them potentially vulnerable to the mismanagement of biodiversity by others.
- Each of these factors can lead to risks to business.
- Entire sectors may be categorised as high risk due to the nature of their business, but individual companies can mitigate this risk.
- As with all business impacts, company exposure to biodiversity risks can be mitigated:
 - first, by the extent to which the risks are recognised
 - secondly, by the extent to which they are properly managed.

1.5 The growing relevance of biodiversity to business

To certain companies in certain sectors – such as extractive companies - biodiversity is already a significant business issue that is well-recognised by the leading companies. It is likely that biodiversity-related risks will become more acute and more widespread across all sectors, as biodiversity rises up the agenda as an environmental and public policy issue. Among the factors that are likely to increase biodiversity risks to companies are:

- Continued, and probably increasing, loss of global biodiversity: recent research predicts that this will happen as a result of a range of factors including climate change.²
- Increased costs or uncertainty for companies dependent on ecosystem services as a result of continued biodiversity loss.
- Legislation to make companies responsible for their biodiversity impacts: this is beginning to emerge. Trends are towards increased use of regulations and other mechanisms to link biodiversity impacts back to the companies that are responsible for them. Possible mechanisms include:
 - a wider definition of biodiversity under the EU liabilities regime
 - biodiversity 'levies', which may be introduced in order to make companies pay for biodiversity impacts, similar to the way this has been done in other fields, e.g. waste management and energy use.
- Increasing scrutiny of supply chain practices and impacts by government and commercial customers, as well as pressure groups.

In addition, current proposals for forthcoming regulation in the UK will require all quoted companies to produce an Operating and Financial Review (OFR).³ In the OFR, directors will be required to report on environmental and other issues, "both where they constitute a significant external risk to the company, and where the company's impact on others through its activities, products or services, may affect its performance."⁴

The government's draft guidance to the OFR gives examples of the information that could be necessary for shareholders to make an informed assessment of the business; amongst a number of examples given, two are of particular relevance to biodiversity⁵:

- "how a company that is a heavy user of natural resources, which may become scarce or the price of which may change significantly, is intending to reduce its dependency on such resources";
- "an explanation of the risk management approaches employed by a company to assess the operational impact on biodiversity where failure to avoid or mitigate damage would put development consents at risk."

² Extinction risk from climate change [Thomas et al, Nature 427, 2004, pp 145 – 148].

³ Draft Regulations on the Operating and Financial Review and Directors' Report. A consultative document. [May 2004, p.23]

See <http://www.dti.gov.uk/cld/financialreview.htm>

⁴ Ibid [draft regulations on OFR].

⁵ Ibid [draft regulations on OFR].

1.6 The next ‘climate change’?

An interesting parallel to the issue of biodiversity is climate change – another issue that combines economic, social and environmental impacts, and in which companies can be seen as both contributors to and victims of the problem.

“Fifteen years ago, companies were saying that climate change was not relevant to business. You could not measure it, companies had no individual responsibility for it, and there were no global regulations to control it. Many companies argued it was not happening at all. Scientific evidence and government action have fundamentally changed this scenario. I believe that the issue of biodiversity could well take the same path.”

Tom Massey, Environmental Regulation Manager, RWE npower

At present, governments, the scientific community and civil society have identified biodiversity loss as a major issue to be addressed, but few companies can clearly see how this will result in a direct impact to their own business. If biodiversity follows the same path as climate change as a public policy issue, we can expect to see more mechanisms put into place by regulators that impose on business the economic costs of its biodiversity impacts - in much the same way that climate change has been linked with business use of energy by taxes and emission trading.

1.7 Nine high-risk sectors – the ‘red zone’

This report identifies nine sectors as high risk, indicating that most companies in these sectors will be exposed to biodiversity risks and that the risks faced by individual companies in these sectors are likely to be significant.

Red zone: high-risk sectors (in alphabetical order)

Construction & Building Materials	Leisure & Hotels
Electricity	Mining
Food & Drug Retailers	Oil & Gas
Food Producers & Processors	Utilities
Forestry & Paper	

1.8 Seven key risks

This report has identified seven ‘headline’ business risks that arise through the relationship between companies and biodiversity:

- **Access to land**
Example: Access to new sites is affected by a company’s track record on protecting/restoring biodiversity and water resources.
- **Reputation⁶**
Example: A biodiversity-related campaign over an issue such as Genetically Modified Organisms or dolphin-friendly tuna, reduces consumer confidence in a brand or company, resulting in lower sales.
- **Access to capital**
Example: Environmental credit risk is assessed as high due to a company’s poor biodiversity track record or management plans, and cost of capital increases.
- **Access to markets**
Example: Inability to meet specifications from substantial buyers - such as government departments and agencies - for sustainably-sourced raw materials like timber, restricts access to a major market.
- **Security of supply**
Example: Reduction in the quality and availability of essential materials such as fish.
- **Relations with regulators**
Example: Concerns about a company’s track record on biodiversity management, or lack of confidence in the quality of its biodiversity survey and management plans, leads to permit delays or fines.
- **Liabilities**
Example: Unforeseen impacts of activities on biodiversity leads to financial liability even though a company’s regulatory licences have not been exceeded.

⁶ ‘Reputation’ is used in this study to refer to risks that may affect the relationship of the company with individual stakeholders e.g. consumers or employees.

1.9 How well are companies doing?

- A significant majority (about two-thirds) of FTSE 100 companies in the red zone sectors are not managing, or not taking substantive action to manage, their biodiversity risks effectively.⁷
- Given that effective risk mitigation begins with proper identification and assessment, we conclude that four red-zone sectors in particular face elevated levels of un-managed risk. These sectors are:
 - Construction & Building Materials
 - Food Producers & Processors
 - Forestry & Paper
 - Leisure & Hotels.
- However, a small number of companies across all sectors have developed good understanding and management in the area of biodiversity. Examples can be found in our case studies.

1.10 How can companies do better?

This report contains recommendations about how companies can reduce their risk exposure. These are summarised as follows:

- All companies potentially exposed to high levels of biodiversity risk should **assess** if these risks are material to their business.
- Companies with material or potentially material biodiversity risks should **develop and publish specific policies** or statements that recognise the significance of the relationship between biodiversity and their business.
- Having identified material risks, companies should put in place measures to manage these risks, including:
 - those arising directly from activities of the company
 - those arising indirectly from activities of the company, including supply chains and the impact of secondary development
 - those that may threaten their business as a result of the mismanagement of biodiversity by others.
- Management of biodiversity should be integrated with the company's pre-existing risk management systems and should set performance targets.
- Companies exposed or potentially exposed to high levels of biodiversity risk should **report** on their management of biodiversity; an appropriate place to do so, in the case of UK companies, would be the OFR.

1.11 Conclusions – is biodiversity a material risk for companies?

This report concludes:

- Biodiversity **does present material risks** to many companies in which ISIS invests, although putting a precise financial value on such risks is often not possible. Where such values can be ascribed, they are often significant.
- The **majority of companies** in our analysis of the 'red-zone' sectors **are not taking substantive action** to manage their biodiversity risks effectively.
- The long-term nature of biodiversity risks means that it can take an unusually long time to identify biodiversity risks, and it is **not easy to take rapid action** to mitigate them once they have been identified; this means that companies with potential risk exposure cannot assume that action can be postponed.
- Although the focus of this report is on the FTSE indices, the conclusions and recommendations are likely to be **directly relevant to companies in all markets.**

Therefore

- **This report should serve as an early warning to companies, particularly those in our red zone: start investigating and managing biodiversity-related risks now.**

⁷ See section 4.2.2 below.

2. Introduction

2.1 Aim and objectives of the report

Over the past decade, global loss of biodiversity, and the consequent economic value of 'ecosystem services', has been rising up the public policy agenda. We have now reached a point at which increased scientific understanding of biodiversity loss, combined with greater analysis of the causes and the potential impacts, has caused the relationship of the corporate sector with biodiversity to come under scrutiny.

Investor attention to biodiversity has to date primarily focussed on the extractive industries, on the assumption that these are the sectors for which biodiversity risks are most likely to be material.

However, a growing number of companies, in a widening range of sectors, are considering and reporting on their biodiversity impacts and associated risks. Indeed, there is growing evidence to suggest that biodiversity risks are also relevant to companies in other sectors.

The overall aim of this report is therefore to address the question: 'Is biodiversity a material risk to companies?' The report aims:

- To identify the business sectors in which the relationship between companies and biodiversity is most likely to lead to material risks.
- To identify sources of risk related to biodiversity that businesses need to take into account as part of their planning and management processes.
- To identify which sectors and companies are most at risk due to lack of awareness and management of biodiversity issues.
- To provide recommendations for action by companies – especially concerning the need for consideration of biodiversity in a company's Operating and Financial Review.

2.2 How we arrived at our results

We believe this to be the first attempt to consider what risks biodiversity may pose for companies across *all* sectors, and to attempt to identify in which sectors companies could be exposed to *material* biodiversity-related risks.

To begin our study, we undertook a survey of 29 relevant professionals, asking them to judge the scale of the relationship between individual sectors and biodiversity. We noted that:

- Companies have a two-way relationship with biodiversity, encompassing both the impact of companies on biodiversity, and the impact of biodiversity on companies.
- Companies can have both direct and indirect impacts on biodiversity.
- Some companies are dependent on biodiversity, in the form of natural products or ecosystem services. This makes them potentially vulnerable to the mismanagement of biodiversity by others.
- Each of these factors can lead to risks to business.
- Entire sectors may be categorised as high risk due to the nature of their business, but individual companies can mitigate this risk.
- As with all business impacts, company exposure to biodiversity risks can be mitigated:
 - first, by the extent to which the risks are recognised
 - secondly, by the extent to which they are properly managed.

We cross-checked and adjusted results from the survey with other evidence on the levels of risk faced by individual sectors, such as:

- The sectors identified as priorities by parties concerned about the biodiversity impacts of, and risks to, business - including investors, NGOs, governments, companies themselves and their industry bodies.
- Previous research and analysis by Earthwatch and ISIS.
- Anecdotal evidence of specific risks faced by companies.
- Information gathered through seven case studies and interviews with additional companies.
- Consideration of the relevance of known risks to companies in other sectors with similar characteristics.

Through this process, we have identified nine sectors for which there is evidence of a significant relationship with biodiversity, and which may result in risks to most companies in these sectors if the risks are not well managed. We have categorised these throughout the report as ‘red zone’ sectors, with further categorisations of all other FTSE sectors into ‘amber’ or ‘green’ zones. Our methodology is covered in more detail in Appendix 1.

To help us assess whether biodiversity risks could be material, we interviewed nine companies to understand the specific biodiversity-related risks that they face, the financial relevance of these risks, where known, and the likely relevance to other companies in their sector (the case studies can be found in section 6).

2.3 Definitions

The working definitions used throughout this report are:

- **Biodiversity:** ecosystems and ecosystem services [see 2.4 below and section 3.4] as well species and genetic variety.⁸
- **Biodiversity risks:** those risks to a company that arise as a result of a situation in which biodiversity is a contributing factor. Biodiversity risks are explored further in sections 5 and 6.
- **Material:** risks likely to be of financial significance to the company.
- **Sectors:** The ‘sectors’ referred to in this report are the ‘Industrial Sectors’ used by the FTSE Global Classification System.
- **High-risk sectors:** sectors in which the biodiversity risk is potentially significant, i.e. the red zone sectors.

2.4 How helpful is the term ‘biodiversity’?

Biodiversity is the term used by the scientific community to describe the number of species and genetic variety within species. The term has also become short-hand for policy makers and conservationists to describe the importance of ecosystems – i.e. the environment or habitats created by many species interacting – and the efforts made to conserve ecosystems. In many ways, it is therefore an unhelpful term, as it covers a multitude of issues relating to ecosystem services and ecosystem management, as well as its pure sense of species diversity. This gives considerable scope for confusion. We use the term in this report because it has been widely used by policy makers – for example in the title ‘Convention on Biological Diversity’ and the ‘UK Biodiversity Action Plan’ – but we recognise that our focus, and the relevance of biodiversity to most companies, is in the wider sense of ecosystem services, management and conservation.

2.5 The financial implications of biodiversity risks

This study considers the likelihood, significance and source of biodiversity risks to a range of business sectors. We have not attempted to quantify these risks in financial terms; although the cost of some specific risks for individuals companies are given in the case studies (section 6), only rarely have the case study companies felt that it was possible or sensible to put a specific financial value on their biodiversity risks. Nevertheless, in all of the case studies, companies felt that the risks were likely to be material to them, and were managing them accordingly.

This report provides information that will help companies begin to assess the risks they are likely to face – risks that could, as the case studies illustrate, be material.

2.6 How significant is the issue of biodiversity?

In certain markets, and without doubt in the UK, biodiversity is already a significant issue in decision making over access to land. The widening interpretation of liabilities has started to encompass biodiversity, and companies are faced with threats to security of supply of raw materials they have taken for granted and restricted access to markets if their products do not live up to their customers’ expectations on sustainable sourcing. Moreover, companies that fail to understand their biodiversity risks may compromise their access to capital. Add to these the less tangible issues of reputation and relations with regulators, and there is an increasingly potent mix of factors that make biodiversity significant to companies.

⁸ The UN Convention on Biological Diversity defines biodiversity as “the variability among living organisms from all sources...and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems” [CBD, Article 2].

In other words, to certain companies in certain sectors, biodiversity is already a significant business issue. It is likely that this risk will strengthen and widen. An interesting parallel to the issue of biodiversity is climate change – another issue that combines social and environmental impacts, and in which companies can be seen as both a cause of the problem and the victims of it.

“Fifteen years ago, companies were saying that climate change was not relevant to business. You could not measure it, companies had no individual responsibility for it, and there were no global regulations to control it. Many companies argued it was not happening at all. Scientific evidence and government action have fundamentally changed this scenario. I believe that the issue of biodiversity could well take the same path.”

Tom Massey, Environmental Regulation Manager, RWE npower

At present, governments, the scientific community and civil society have identified biodiversity loss as a major issue to be addressed, but few companies can clearly see how this will result in a direct impact to their own business. If biodiversity follows the same path as climate change as a public policy issue, we can expect to see more mechanisms put into place by regulators that link biodiversity impacts back to business - in much the same way that climate change has been linked by taxes and emission trading with business use of energy.

In the environmental policy arena government decision-makers can choose from a variety of policy instruments to address biodiversity-related issues. In broad terms, government intervention can take two forms

- The introduction of environmentally related taxes or other economic (market-based) instruments, such as marketable permits or allowances, user charges or fees, targeted subsidies, deposit-refund schemes or performance bonds.
- The introduction of command-and-control approaches (regulations, norms, prohibitions and prescriptions), where the government sets an environmental objective and commands producers/consumers to control their activities in order to meet that objective.

To summarise: biodiversity, while not necessarily under that name, is already significant to certain sectors. If biodiversity continues to rise up the public policy agenda, this is likely to be matched by more understanding and action from regulators, leading companies, NGOs, financial markets and consumers. The more significant biodiversity becomes for these groups, the more significant it will become for the corporate sector as a whole.

3. How is biodiversity relevant to business?

“This new report is a crucial recognition from major financial institutions that the environmental and social components of sustainable development, as well as the economic considerations, should sit at the heart of investment and capital market considerations.”

Klaus Toepfer, UNEP Executive Director, at the launch of the report “The Materiality of Social, Environmental and Corporate Governance Issues to Equity Pricing”, UN Global Compact Leaders Summit, New York, 24 June 2004.

3.1 Policy makers are becoming concerned about increasing loss of biodiversity

There is a solid body of scientific evidence that biodiversity is being lost, that it is happening quickly,⁹ and that this high rate of loss is a result of human impacts.¹⁰ There is also an emerging consensus that this could have profound consequences for the continued provision of ecosystem services, and the abundance and quality of natural products, that people have for centuries been able to take for granted.

Recent international commitments have increased pressure for action. For example, the EU has recently set a target to halt biodiversity loss by 2010. The World Summit on Sustainable Development (WSSD) also set a target to “achieve by 2010 a significant reduction in the current rate of loss of biological diversity”.¹¹

Biodiversity has therefore become an issue of global environmental importance, that features ever more prominently in the agenda of local and national governments, inter-governmental bodies and pressure groups. Although the biodiversity ‘issue’ is sometimes characterised as concern for particular threatened species or habitats, the debate at policy level is much more complex, with focus turning towards the ecosystem functions that biodiversity provides and the need to maintain these. At the same time, there is a greater awareness of the impact of industrialisation and corporate behaviour on biodiversity – and the importance of biodiversity in maintaining ecosystem services on which certain companies depend.

BOX 1

How biodiversity NGOs drive campaigns on other ‘headline’ issues

Conservation organisations driven by biodiversity concerns are adding their weight to campaigns on human health and safety, and humanitarian and human rights issues, where the activities concerned also impact on biodiversity.

For example, WWF (the World Wide Fund For Nature)¹² is one of the world’s most recognised brands and one of the most active, largest and most visible campaigning organisations on biodiversity-related issues. Some of its current campaigns include work focussed on:

- Impacts of man-made chemicals on the brain development of children.¹³
- Progress of the world’s governments towards meeting commitments for the provision of freshwater to human populations.¹⁴
- Human rights and displacement caused by dam construction.¹⁵

⁹ Estimates are of current rates of loss at 1,000 to 10,000 times faster than for most of the fossil record. Assessing extinction rates [May et al. 1995 in *Extinction Rates* (eds. Lawton & May), pp 1-24, OUP, Oxford].

¹⁰ Due to habitat loss, direct exploitation, introduced species, pollution and climate change; see for example *Global Biodiversity Strategy* [World Resources Institute, Washington, 1992] at http://biodiv.wri.org/pubs_content.cfm?PubID=2550

¹¹ See <http://europa.eu.int/comm/environment/eussd/>

¹² <http://www.wwf.org>

¹³ http://panda.org/about_wwf/what_we_do/toxics/news/news.cfm?uNewsID=13449

¹⁴ <http://panda.org/downloads/freshwater/csd12casescorecardreport.pdf>

¹⁵ http://www.panda.org/about_wwf/what_we_do/freshwater/what_we_do/policy_events/dams/examples/ilisu.cfm

3.2 The Operating and Financial Review in the UK

Current proposals for forthcoming regulation in the UK will require all quoted companies to produce an Operating and Financial Review (OFR).¹⁶ In the OFR, directors will be required to report on environmental and other issues, “both where they constitute a significant external **risk** to the company, and where the company’s **impact** on others through its activities, products or services, may affect its performance.”¹⁷

The OFR will (according to the draft released for consultation in May 2004) require this information to be provided on issues where the directors judge the information is “necessary” to enable shareholders of the company “to assess the strategies adopted by the company and the potential for those strategies to succeed”.

The government’s draft guidance to the OFR goes on to give examples of the information which could be necessary for shareholders to make an informed assessment of the business; amongst a number of examples given, two are of particular relevance to biodiversity:¹⁸

- “how a company that is a heavy user of natural resources, which may become scarce or the price of which may change significantly, is intending to reduce its dependency on such resources”
- “an explanation of the risk management approaches employed by a company to assess the operational impact on biodiversity where failure to avoid or mitigate damage would put development consents at risk.”

3.3 Liabilities and the ‘polluter-pays’ principle are applied to biodiversity

There are several examples already in place of how governments may apply the ‘polluter-pays’ principle to make companies responsible for the costs of their impacts on biodiversity.

In the USA, Canada, Australia, Belgium and Brazil, legislation already exists which establishes something akin to a biodiversity ‘levy’. Operations causing damage to biodiversity are given permission to go ahead only on the basis that damage to biodiversity will be offset (i.e. made up for by ‘equivalent’ biodiversity gains elsewhere); or that appropriate compensation will be paid to enable other parties to undertake similar offset activities.

The EU Environmental Liabilities Directive is another example of such a mechanism. This Directive is covered in detail in section 5.2.1.

3.4 The economic value of ecosystem services

The value of biodiversity to many companies does not relate to individual species, but the provision of natural or ‘ecosystem’ services that are sustained through the complex simultaneous interaction between many species. There is a wide range of such ecosystem services on which people, companies and the global economy rely. The total global value of ecosystem services has been estimated at \$33 trillion per annum.¹⁹

In assessing the relationship, or the materiality, of ecosystem services to their operations, companies may find it useful to consider how damage to, or loss of, these services and functions would affect their business. In terms of management planning, it is important to evaluate whether the loss of such services is likely to be due to the activities of the company, or mis-management by parties unconnected with the company. Box 2 (overleaf) lists some of the ecosystem services which are relevant to the corporate sector.

¹⁶ Draft Regulations on the Operating and Financial Review and Directors’ Report. A consultative document [May 2004, p.23]. See <http://www.dti.gov.uk/cld/financialreview.htm>

¹⁷ Ibid [draft regulations on OFR].

¹⁸ Ibid [draft regulations on OFR].

¹⁹ The value of the world’s ecosystem services and natural capital [Constanza et al, Nature 387, 1997, pp 253-259].

Examples of ecosystem services

Regulatory and homeostatic services:

- Purification of air and water.
- Detoxification and decomposition of wastes.
- Stabilisation and moderation of the Earth's climate.
- Moderation of floods, droughts and temperature extremes and creation of drainage systems.
- Generation and renewal of soil fertility, prevention of soil erosion, nutrient cycling.
- Pollination of plants, in particular food crops.
- Control of pests and diseases.
- Capacity to regenerate and recover after damage (both from human and natural causes).

Products:

- Provision of food.
- Building materials.
- Fuel: wood, fuel crops and biomass.
- Genetic resources for medicines, foods and other products.

Cultural and Social Services:

- Resources for recreation and tourism.
- Aesthetic and cultural value.

3.5 Biodiversity is embedded within other CSR issues

Biodiversity is not a stand-alone issue; it is very much inter-related with other Corporate Social Responsibility (CSR) and sustainability issues. However, it may need special consideration to ensure that the biodiversity element is not hidden and overlooked by the other 'headline' issues before being integrated back into management systems and processes.

Many of the risks that are covered in this report might typically not be described by companies as biodiversity risks. Companies are often managing their biodiversity risks by default where they overlap with other CSR initiatives. However, companies featured in the case studies are tending to give special consideration to the biodiversity components of their overall social, environmental and ethical (SEE) risks.

Biodiversity is in reality as much a social issue as an environmental issue. The complex inter-relationships between genes, species and ecosystems, and the human populations that rely on and benefit from them, mean that biodiversity concerns are inseparable from concerns over other issues.

At the World Summit on Sustainable Development in 2002, the five priority issues discussed – water, energy, health, agriculture and biodiversity – were all noted to be heavily interdependent.

"Biodiversity [...] provides basic ecological services on which all life depends. Unless we stop the loss of biological resources, our efforts to reach the Millennium Development Goals by the 2015 will be that much more difficult, if not impossible."

Kofi Annan, Secretary-General to the United Nations, 22 May 2003²⁰

In other words, companies that do not identify and integrate biodiversity issues as part of their wider environmental risk assessment may under-estimate the size of these risks. The result may be that a company fails to prioritise its SEE risks adequately or that it fails to manage the specific biodiversity dimensions of its SEE risks. In this case, even though the company is managing other components of its SEE risks, it may face problems through failing to 'defuse' the biodiversity component.

²⁰ The Millennium Development Goals are to "dramatically improve health and reduce poverty of the world's population by 2015" [www.developmentgoals.org/].

Biodiversity as a component of other 'headline' issues

Examples of 'headline' issues that may incorporate an important biodiversity dimension are human health, humanitarian crises and human rights. At times, the dynamics of campaigns and positions taken in policy discussions are likely to be influenced by underlying biodiversity concerns, because some of the participants will be driven by a biodiversity 'motive'. Companies that understand the biodiversity aspect of these issues will be better prepared to identify and respond to these situations.

For example, chemical pollutants that affect human health also put a long-term, persistent pressure on plant and animal populations, and are one of the five main causes cited for biodiversity loss. This has put conservation organisations on the same platform as health campaigners in lobbying for regulation of the chemicals industry (see box 1). In a similar way, unsustainable management of freshwater resources is a humanitarian issue, but can also be a major threat to biodiversity.

A further example is given by a recent report from the investment broker Goldman Sachs,²¹ which considers the impact of environmental and social issues on 23 oil and gas companies. The report concludes that:

"...environmental and social issues will become increasingly important for oil and gas companies seeking to access the new legacy assets, which we view as the key driver of future performance and valuation."

Although the Goldman Sachs report did not consider biodiversity as a specific issue, of 10 environmental and social issues highlighted in a 'snapshot' of issues judged potentially to affect access to sites around the world, 8 issues relate directly to biodiversity concerns.

3.6 Globalisation increases exposure to biodiversity risk

A key general business risk is geographical risk. Many companies now have supply chains or operations in developing countries. These often overlap with areas of high biodiversity value as many of the world's poorest countries, and lowest-wage economies, are also the world's most biodiverse regions. However, in many developing countries, regulation is often not effective or not enforced.²² Furthermore, the building blocks for understanding and managing biodiversity in developing countries are often not in place.

In particular, there is a basic lack of information about much biodiversity in the tropics. This is partly due to limited resources for research, and partly because the quantity of biodiversity (ie both the numbers of species and the abundance of specific species) is so great. In addition, biodiversity is often under great pressure from the subsistence activities of poor human populations as well as the expansion of agriculture and other industrial activity into new regions.

The lack of clear regulatory frameworks and knowledge on biodiversity characteristically lead to unusually high biodiversity-related risks for companies operating in developing countries, either directly or in their supply chains. For example, companies may find that they are operating in an area of high biodiversity value, that has not been designated as a protected area by the government, but becomes the subject of an international campaign by conservation NGOs; or a company may find that its activities have an unforeseen affect on the livelihoods of poor communities that are dependent on biodiversity.

²¹ Global Energy: Introducing the Goldman Sachs Energy Environmental and Social Index [Goldman Sachs Global Investment Research February 2004, p 35]. Issues include: protection of the spawning grounds cod in Norway and Sturgeon in the Caspian; threats to endangered Grey whales off the East coast of Russia; damage to tropical forest in Africa and South America; and protection of wildlife migration routes in Alaska.

²² Governance and the loss of biodiversity [Smith et al., Nature 426, 2003, pp 67-70].

3.7 Today's long-term issue is tomorrow's material risk

Biodiversity seldom manifests itself as a major risk in the short-term. However, it is characteristically a risk that needs to be tackled in its early stages in order to affect the long-term outcome. Many of the case studies in this report demonstrate a range of timescales over which biodiversity-related issues may present risks to the businesses concerned – and yet each of these companies is managing these risks today. Why should this be so?

In part, this is because it can take several years to:

- Review the impacts and risks across the whole business, due to a lack of understanding and relevant information.
- Conduct surveys to provide baseline biodiversity data on which assessment of potential impacts can be based; even then, further research may be required to understand the significance of the potential impact, and what action is required.
- Build the trust needed to work effectively with other players such as government bodies and NGOs in order to work in partnership to address these issues.
- Understand and develop credible and acceptable practices which are biodiversity 'friendly' – for example, one global food producer has been working since 1990 on its sustainable agriculture programme. Of its 10 sustainability indicators, biodiversity has presented the most challenges and it has not yet fully established good practice guidelines to help suppliers address biodiversity issues effectively.
- Develop an appreciation of the issues amongst key company personnel.

It is therefore not easy to take rapid action to mitigate biodiversity risks once they have been identified. The companies in our case studies in general believe that actions they take now are likely to make them better prepared than their competitors for forthcoming changes to legislation and stakeholder expectations: as in many areas of business strategy, companies that are pro-active can gain comparative advantage over those that are reactive.

3.8 The changing landscape: factors that are likely to make biodiversity more relevant to companies

Biodiversity is clearly rising up the agenda as an environmental and public policy issue, and outlined above are some of the areas that make this relevant to the business community. Factors which are likely to increase biodiversity risks to companies include:

- Continued, and probably increasing, loss of global biodiversity: recent research predicts that this will continue and increase as a result of a range of factors including climate change.²³
- Increased costs or uncertainty for companies dependent on ecosystem services as a result of continued biodiversity loss.
- Legislation to make companies responsible for their biodiversity impacts: this is beginning to emerge. Trends are towards increased use of regulations and other mechanisms to link biodiversity impacts back to the companies which are responsible for them. Possible mechanisms include:
 - a wider definition of biodiversity under the EU liabilities regime
 - biodiversity 'levies', which may be introduced in order to make companies pay for biodiversity impacts, similar to the way this has been done in other fields, e.g. waste management and energy use.
- Wider application of biodiversity criteria within credit risk assessments or project finance: such as the Equator Principles,²⁴ which have set a precedent for the consideration of SEE risks in project finance. These currently apply mainly to the extractives and construction sectors; but there could be a broader application of such standards in the future, that will affect other sectors.
- Increasing scrutiny of supply chain practices and impacts by government and commercial customers, and pressure groups.
- Growing pressure for companies to act in a more socially and environmentally responsible manner, and wider definitions of what this means and where responsibilities lie. This may mean that mismanagement of biodiversity by others creates greater pressure for companies to manage their own impacts adequately.

²³ Extinction risk from climate change [Thomas et al, Nature 427, 2004, pp 145 – 148].

²⁴ www.equator-principles.com

4. Which sectors are exposed to biodiversity risks?

4.1 Designating levels of biodiversity risk by sector

In the context of this report, the level of risk facing a sector is the result of the interaction between two dimensions of risk:

1. the **proportion** of companies in the sector likely to be exposed to biodiversity risks; and
2. the **significance** of the risks likely to be faced by individual companies in a sector.



Accordingly, we have assigned the FTSE Sectors to one of three groups: red, amber or green. The methodology is outlined in section 2.2 and explained fully in Appendix 1.

The red-zone sectors, our top nine, are those sectors in which we believe:

- **most companies** are likely to be exposed to biodiversity risks; and
- the risks are **likely to be significant**.

The amber-zone sectors, are those in which we believe:

- **some companies** are likely to be exposed to biodiversity risks; and
- the risks **may be significant**.

The green-zone sectors are those for which we believe:

- **fewer companies** are likely to be exposed to biodiversity risk; and
- it is harder to identify how, if at all, biodiversity risks may significantly affect the companies in these sectors.

The risk level assigned to each sector is shown in table 1 below.

Table 1 Level of biodiversity risk by sector.

Within each zone, sectors are presented in alphabetical order; the ordering does not reflect different levels of risk.

Red zone High-risk sectors:	Amber zone Medium-risk sectors:	Green zone Lower-risk sectors:
Most companies exposed to risks Risks likely to be significant	Some companies exposed to risks Risks may be significant	Risk variable and significance unknown
Construction & Building Materials Electricity Food & Drug Retailers Food Producers & Processors Forestry & Paper Leisure & Hotels Mining Oil & Gas Utilities	Beverages Chemicals Financial Services General Retailers Household Goods & Textiles Personal Care & Household Products Pharmaceuticals & Biotech Support Services Tobacco Transport	Aerospace & Defence Automobiles & Parts Diversified Industrials Electronic & Electrical Equipment Engineering & Machinery Health Information Technology Hardware Media & Entertainment Software & Computer Services Steel & Other Metals Telecom Services

4.2 Gap-analysis: Which sectors and companies do not appear to be aware of their biodiversity risks?

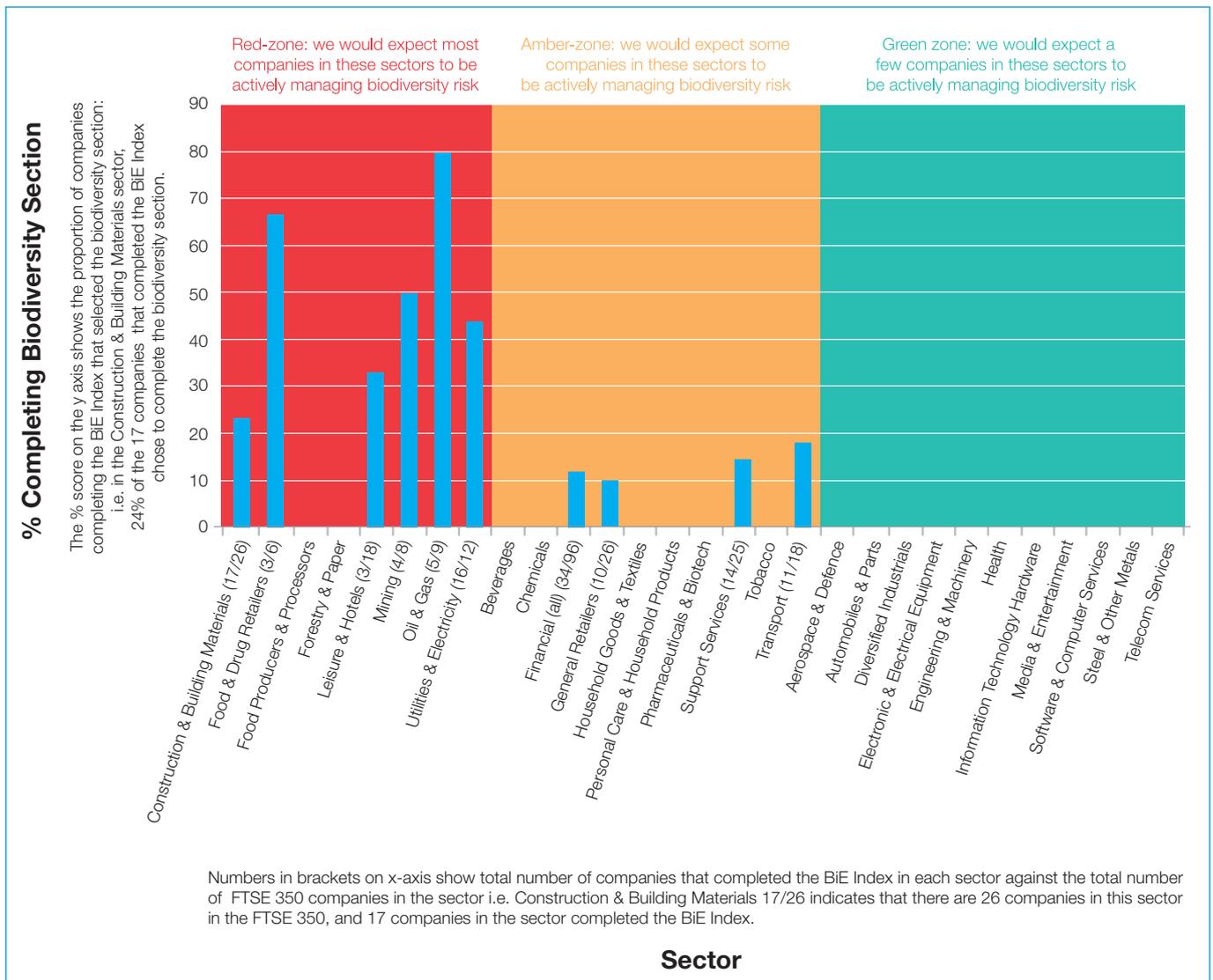
We have used the level of participation in the biodiversity section of the Business in the Environment Index (BiE Index) as an indicator of awareness of biodiversity risks.^{25, 26}

- The BiE Index is a voluntary survey sent annually to the FTSE-350 companies and a small number of other companies.
- Companies are given the option to complete different sections based on their judgement of their key impact areas: biodiversity is one of these sections.
- Around two hundred companies complete the survey.

Chart 1 Gap-analysis: level of participation in BiE Index question on biodiversity.²⁷

This chart illustrates the proportion of companies in each sector that choose to answer the BiE Index section on biodiversity.

Companies could chose to answer the biodiversity question if they had identified biodiversity as one of their “most significant impact areas”.



²⁵ For information on our methodology and the BiE Index, see appendix 1.

²⁶ It should be noted that this assessment is not directly comparable with that in section 4.2.2, as section 4.2.2 compares only the FSTE 100 companies in the red zone, whereas the BiE Index universe is based on the FTSE 350 and other selected companies.

²⁷ Some sectors have been grouped by BiE to avoid making public the scores of individual companies where only one company took part from a given sector.

4.2.1 Which red-zone sectors do not appear to be aware of their biodiversity risks?

Of the 'BiE companies' in our red-zone sectors [see chart 1]:

- No companies in the Food Producers & Processors or Forestry & Paper sectors have identified biodiversity as a significant impact.
- Few companies in the Construction & Building Materials and Leisure & Hotels sectors have identified biodiversity as a significant impact.

Based on the BiE Index participation, we conclude that the red-zone sectors in which companies are **least aware** of their biodiversity risks are:

- Construction & Building Materials.
- Food Producers & Processors.
- Forestry & Paper.
- Leisure & Hotels.

In addition, we note that several companies in the amber-zone sectors **do identify as significant** their impact on biodiversity, confirming the assumption that biodiversity is likely to be material for some companies in the amber and green zone sectors.

4.2.2 Which FTSE 100 companies in red-zone sectors demonstrate a commitment to assessing and managing biodiversity risks?

We have assessed whether each of the twenty-eight FTSE 100 companies²⁸ in the nine red-zone sectors are:

- taking substantive action to assess and manage biodiversity risks consistently and effectively, or
- demonstrating an understanding of the need to take such action.

This assessment is based on the research and prior knowledge of ISIS and Earthwatch, as a result of our engagement with many FTSE 350 companies on biodiversity, and our awareness of the related biodiversity initiatives in which companies are involved. It is important to note that this is an assessment and not a survey, although some results have been obtained through prior survey work,²⁹ and our assessments have been cross-checked in a review of companies' websites and published materials.

We have placed companies in the following three categories:

- Companies assessed as taking substantive and consistent action to manage biodiversity risks [for example, showing clear evidence of consistently turning policy into action]
- Companies demonstrating understanding and awareness of the need to assess and manage biodiversity consistently and effectively [for example, publishing a clear policy or strategy for managing biodiversity risks]
- Other [for example, no information is available, either publicly or through research by ISIS and Earthwatch, to indicate that the company is aware of biodiversity risks or taking action to manage them consistently and effectively].

The results of this assessment are in table 2.

²⁸ As at 1 June 2004.

²⁹ 'Are Extractive Companies Compatible with Biodiversity?' [ISIS Asset Management, London, 2004].

Table 2 Which companies in the red-zone sectors are known to be actively taking action to address their biodiversity risks? [Note: *refers to FTSE 350 as there are no FTSE 100 companies in this sector].

Red-zone sectors	1. FTSE 100 companies taking substantive and consistent action to manage biodiversity risks effectively	2. FTSE 100 companies demonstrating an understanding and awareness of the need to assess and manage biodiversity risks consistently and effectively	3. Other FTSE 100 companies
Construction & Building materials	Hanson	Wolseley	
Electricity	Scottish and Southern Scottish Power		
Food & Drug Retailers		Sainsbury's	Tesco Morrison
Food Producers & Processors	Unilever	Cadbury Schweppes	Associated British Foods
Forestry & Paper*			Smith DS
Leisure & Hotels		Whitbread	Carnival Enterprise Inns Hilton Intercontinental William Hill
Mining	Anglo American Rio Tinto	BHP Billiton	Antofagasta
Oil & Gas	BG Group BP Shell		
Utilities	Severn Trent United Utilities	National Grid Transco	Centrica

Rating the Leisure & Hotels sector

The Leisure & Hotels sector was not initially ranked as high risk by our experts' survey.³⁰ However, subsequent research highlighted the presence of this sector on the 'radar screen' of NGOs and governments working on biodiversity, arising from the significant impacts that facilities and resource use for tourism can have on biodiversity. We also noted that there is a strong link between much of the tourism industry and biodiversity that is largely ignored, except by niche 'ecotourism' operators. For this reason, this sector appears in our red zone [see section 5 for further explanation of the nature of the risks]. We note that companies in this sector are likely to face heightened risks when operating outside the UK.

³⁰ See Appendix 1 for more detail on methodology.

4.3 Summary

Nine FTSE sectors have been classified as high-risk (red-zone sectors), ten sectors as medium risk (amber-zone sectors) and eleven sectors as lower risk (green-zone sectors).

Of FTSE 100 companies in the red-zone sectors, the study finds that:

- 39% are taking substantive action to assess and manage biodiversity risks consistently and effectively.
- 22% demonstrate an understanding and awareness of the need to assess and manage biodiversity risks consistently and effectively.
- 39% are in neither of the above categories.

A gap-analysis of the **FTSE 350 companies**,³¹ comparing our red zone sectors to BiE Index's biodiversity section participation, shows that the following red-zone sectors appear to demonstrate low levels of awareness to - and by extension, a lack of management of - biodiversity risks:

- Construction & Building Materials.
- Food Producers & Processors.
- Forestry & Paper.
- Leisure & Hotels.

4.4 Conclusions

- Nine FTSE sectors can be identified through our research as being in the red-zone – i.e. most companies in those sectors are likely to be exposed to biodiversity risks; and the risks are likely to be significant.
- A significant majority (61% or about two-thirds) of FTSE 100 companies in the red zone sectors are not managing, or taking substantive action to manage, their biodiversity risks effectively.
- Assuming that risk mitigation begins when a company has identified its risks, four red-zone sectors in particular face elevated levels of un-managed risk, based on a comparison between the BiE Index and our red zone.
- A number of companies in amber-zone sectors have identified significant biodiversity impacts. This implies that other amber-zone companies could also be exposed to high levels of biodiversity risk.

³¹ This refers to companies completing the BiE Index, which is drawn from the FTSE 350 and a small number of other companies.

5. Why are these sectors at risk?

Types of biodiversity-related risks that companies face

In this section, we have identified seven types of risk relating to biodiversity, and identified to which of the red-zone sectors they are relevant. Table 3 identifies which of these risks is relevant to each of the red zones sectors; and Table 4 gives examples of how risks in these categories relate to the amber and green zones sectors.

5.1 Types of risk

Analysis of our experts' survey, other literature and the case studies leads us to identify seven headline sources or types of biodiversity risk. These are:

- **Access to land**
Example: Access to new sites is affected by a company's track record on protecting/restoring biodiversity and water resources.
- **Reputation**³²
Example: A biodiversity-related campaign over an issue such as Genetically Modified Organisms or dolphin-friendly tuna, reduces consumer confidence in a brand or company, resulting in lower sales.
- **Access to capital**
Example: Environmental credit risk is assessed as high due to a company's poor biodiversity track record or management plans, and cost of capital increases.
- **Access to markets**
Example: Inability to meet specifications from substantial buyers - such as government departments and agencies - for sustainably-sourced raw materials like timber, restricts access to a major market.
- **Security of supply**
Example: Reduction in the quality and availability of essential materials such as fish.
- **Relations with regulators**
Example: Concerns about a company's track record on biodiversity management, or lack of confidence in the quality of its biodiversity survey and management plans, leads to permit delays or fines.
- **Liabilities**
Example: Unforeseen impacts of activities on biodiversity leads to financial liability even though a company's regulatory licences have not been exceeded (see 5.2.1 below).

5.2 The changing nature of liabilities and credit

Among the seven key risks listed above, two are in an era of rapid development: liabilities and access to capital, both of which are subject to initiatives that encompass biodiversity although they have been designed to cover broader areas of environmental performance. These initiatives are outlined in more detail below.

5.2.1 The EU Environmental Liabilities Directive

The EU Environmental Liabilities Directive³³ entered into force on 30 April 2004 and must be implemented by member states into national law by 2007. The Directive specifically implements the "polluter pays principle" and is intended to result in a higher degree of environmental protection throughout Europe.³⁴ Its fundamental aim is to hold operators whose activities have caused environmental damage financially liable for remedying this damage. In addition, the Directive holds those whose activities have caused an imminent threat of environmental damage liable to taking preventive actions. It is expected that this will result in an increased level of prevention and precaution.

The Liabilities Directive puts in place, for the first time in the EU, a comprehensive liability regime for damage to the environment. In particular, it introduces a comprehensive regime for damage to protected species and natural habitats on a scale that no member state has imposed so far.³⁵

³² 'Reputation' is used in this study to refer to risks that may affect the relationship of the company with individual stakeholders e.g. consumers or employees.

³³ Directive 2004/35/EC entered into force on 30 April 2004; member states must implement in national law by 2007.

³⁴ FAQs on Environmental Liabilities Directive at <http://europa.eu.int/comm/environment/liability>

³⁵ 'Where there's brass...' Financial Management, September 2004, pp.14-15.

Liability for biodiversity damage is something new in Europe, and so in order to have a very precise and workable definition of biodiversity, this has currently been limited to damage to all species and habitats protected under the 1992 Habitats Directive as well as most threatened species and migratory birds protected under the 1979 Birds Directive.

The Habitats Directive lists 800 animal and plant species, and the Birds Directive identifies 181 vulnerable and threatened bird species. Protected areas under the Habitats Directive - part of the Natura 2000 network - are made up of over 15,500 individual sites and cover almost 14% of EU land territory. These protected species and areas represent biodiversity that has been found to be particularly rich and socially valuable in the EU. Ten years after the entry into force of the Directive in the Member States, this definition will be reviewed and, if appropriate, changed.

The Liabilities Directive also defines environmental damage as damage to water resources in the EU as well as land contamination that risks harming human health.

The Liabilities Directive applies to operators who professionally conduct risky or potentially risky activities. These activities include, amongst others, industrial and agricultural activities requiring permits under the 1996 Integrated Pollution Prevention and Control Directive, waste management operations, the release of pollutants into water or into the air, the production, storage, use and release of dangerous chemicals, and the transport, use and release of genetically modified organisms. Under this regime, an operator can be held liable even if it has not committed any fault (though there are a few cases in which it can be exempted from liability).

The Directive also applies to activities not listed above, but in this case an operator will only be held liable if s/he was at fault or negligent and if s/he has caused damage to protected species and natural habitats protected at EU level under the 1992 Habitats and 1979 Birds Directives.

The Directive does not place a limit on the potential value of liabilities. Figures that may have a bearing on potential liabilities include:

- The value of the world's ecosystem services supported by biodiversity have been very approximately valued at US\$33 trillion per year, or approximately twice the global GNP.³⁶
- Spanish authorities spent over €240 million on clean-up activities after a dam containing mine waste burst releasing toxic sludge into Doñana Natural Park, poisoning soil and water and killing wildlife.³⁷

5.2.2 The Equator Principles

On 4 June 2003, 10 multinational financial institutions announced their voluntary commitment to the Equator Principles. The Principles set an industry standard for determining, assessing and mitigating social and environmental impacts in project finance.

Developed in co-ordination with the International Finance Corporation (IFC), and based on the World Bank and IFC's safeguard policies, the Principles apply to loans greater than \$50 million. "Equator banks" commit to ensuring that borrowers have developed projects in a manner that is socially responsible and reflects sound environmental management practices. They specifically cite the protection of biodiversity, including endangered species and sensitive ecosystems, as examples of issues that must be addressed. Compliance with environmental and social standards is included in loan covenants and non-compliance can trigger a default.

As of August 2004, 27 financial institutions – comprising 25 banks, one export credit agency and one multilateral agency – had committed to adopting the Principles. These Equator banks currently represent in excess of 75% of the total project finance market, by deal volume.³⁸

³⁶ The value of the world's ecosystem services and natural capital [Constanza et al, Nature 387, 1997, pp 253-259] see <http://www.wri.org/wri/trends/ecoserv.html>

³⁷ <http://europa.eu.int/comm/environment/liability>

³⁸ Dealogic, London 4 June 2004 www.dealogic.com. This volume does not include project loans arranged by government agencies, which were an estimated additional \$10 billion of project loans in 2003.

Table 3

Table 3 demonstrates how our seven risk categories relate to individual red-zone sectors. We have indicated the risks which we believe are most relevant to the sector although individual companies may also have risks in other categories.

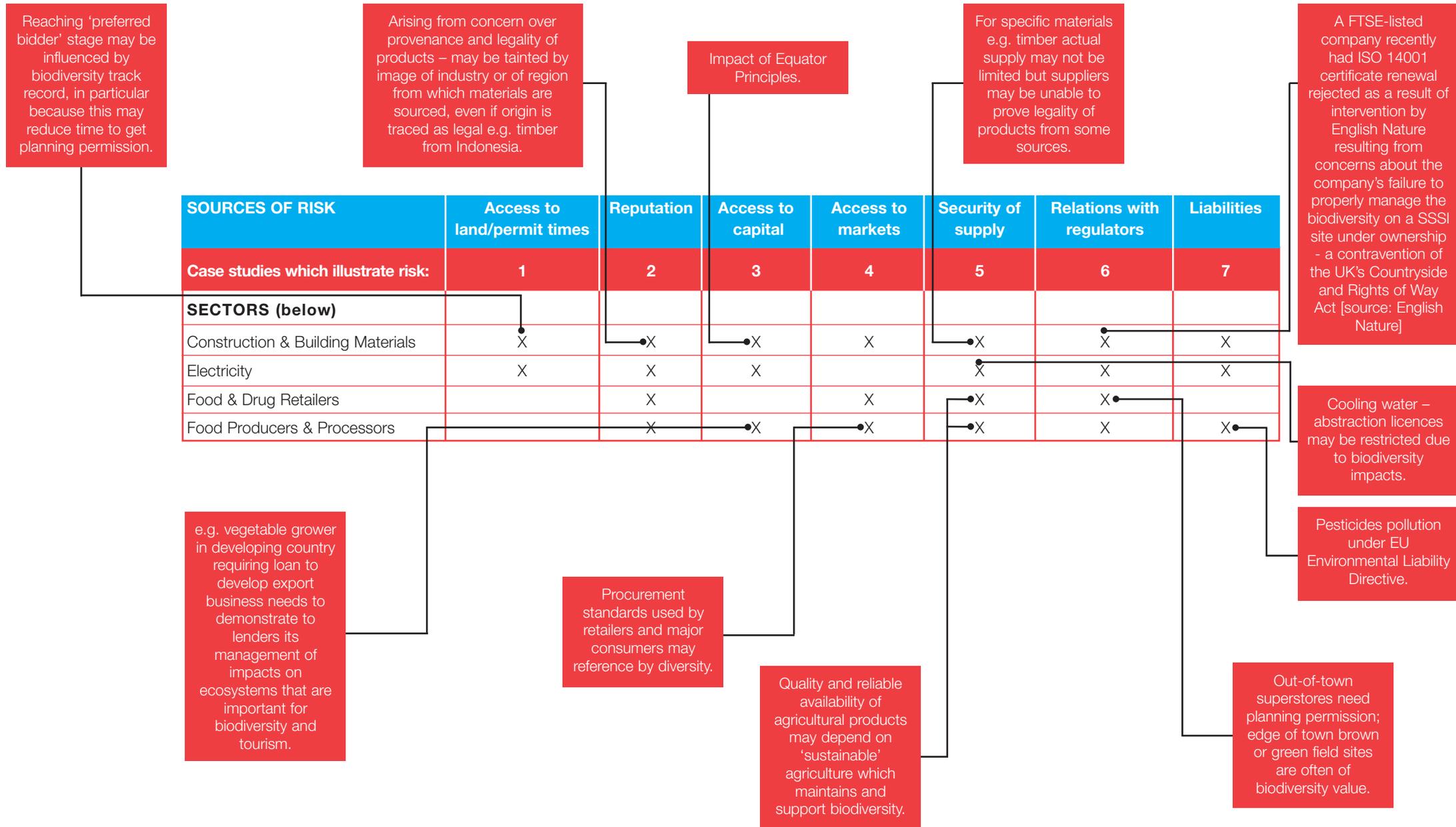
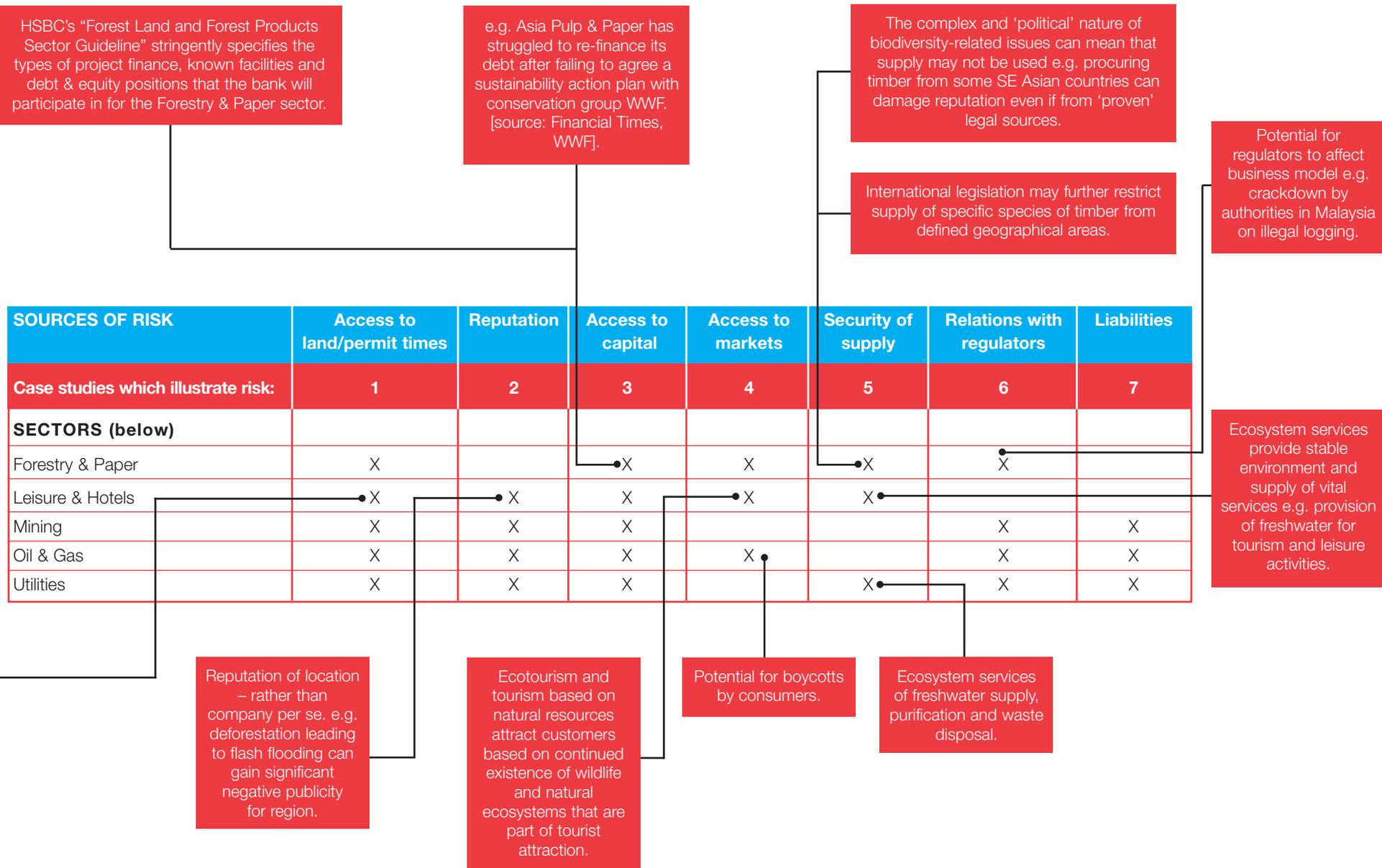


Table 3 continued



5.3. Warning signs for amber and green zone sectors

It is evident that some companies in the green and amber zones share characteristics of red zone sectors and therefore may equally be at risk. For example, a General Retailer with a large food division may carry the same biodiversity risks as a Food Retailer. Table 4 illustrates how the seven key risk areas may be relevant to companies in the amber and green zones which have some or all of these characteristics.

We have identified eleven key characteristics of companies in red-zone sectors, that give rise to biodiversity risks and may act as a warning sign for companies in other sectors. All companies that exhibit these characteristics could potentially be exposed to equivalent levels of biodiversity risk – this includes companies in the amber-zone and the green-zone.

- Companies that are dependent on access to specific areas of land or water [see example below].
- Users or producers of agricultural raw materials [see example below].
- Retailers of products derived from agricultural raw materials.
- Companies using or manufacturing products which impact on biodiversity as pollutants.
- Companies creating or managing waste which can impact on biodiversity.
- Companies involved in cyclical/repeated infrastructure development.
- Companies whose major customers are multinational companies or government agencies or departments - many of which have or are in the process of developing sustainability procurement criteria.
- Companies financing, underwriting, insuring or investing in projects and activities that can impact, or rely upon, biodiversity.
- Consumer-facing companies sensitive to fluctuations in market share.
- Companies that are operating in or sourcing from developing countries which are themselves rich in biodiversity or have poor biodiversity protection.

Examples of how such characteristic may be relevant to several sectors are:

- **Companies that are dependent on access to specific areas of land/water**
The location of companies' operations can often be dictated by the location of specific resources to which they need access. In some cases a company can find itself – out of necessity - operating in delicate ecosystems that would be avoided by other industries. Importantly, this increases the chances that mismanagement of biodiversity by others may have a knock-on impact on a company's own operations. Moreover, the company may have little or no control over the agent causing these knock-on impacts. A red-zone example of this is extractive companies, which have to operate in the location where oil or minerals are discovered. An example of how this relates to the amber zone is the transport sector: port operators are also subject to geographical restrictions, as ports must be on the coast and often require deep-water access [see ABP in table 4].
- **Users or producers of agricultural raw materials**
Users and producers of agricultural raw materials are likely to be reliant on ecosystem services for the security of their supply and maintaining food quality. Three examples of ecosystem services in this context are:
 - 40 crops in the United States with a total annual market value of US\$40 billion are completely dependent on insect pollinators³⁹
 - biological pest control has an estimated annual value of US\$100–200 billion⁴⁰
 - microbial nitrogen fixation has an estimated annual worth of US\$50 billion.⁴¹

These services can only be provided through interactions between different organisms, not by one or two species alone; it is the diversity that produces the effects. Mismanagement of biodiversity by others could therefore heavily affect Food Producers & Processors. Furthermore, those companies are likely to be part of the supply chains of consumer-facing companies, whose own reputations and product lines may be at risk if agricultural products decline in quality or availability. In the red zone sectors, this might affect Food Retailers; but it is also relevant in the amber zone to General Retailers that have substantial food retail divisions.

³⁹ A framework for action on biodiversity and ecosystem management [UN WEHAB Working Group. August 2002].

⁴⁰ Ibid note 38 [UN WEHAB Working Group. August 2002].

⁴¹ Ibid note 38 [UN WEHAB Working Group. August 2002].

Table 4

Table 4 demonstrates some specific risks that are relevant to companies in the amber-zone and green-zone sectors.

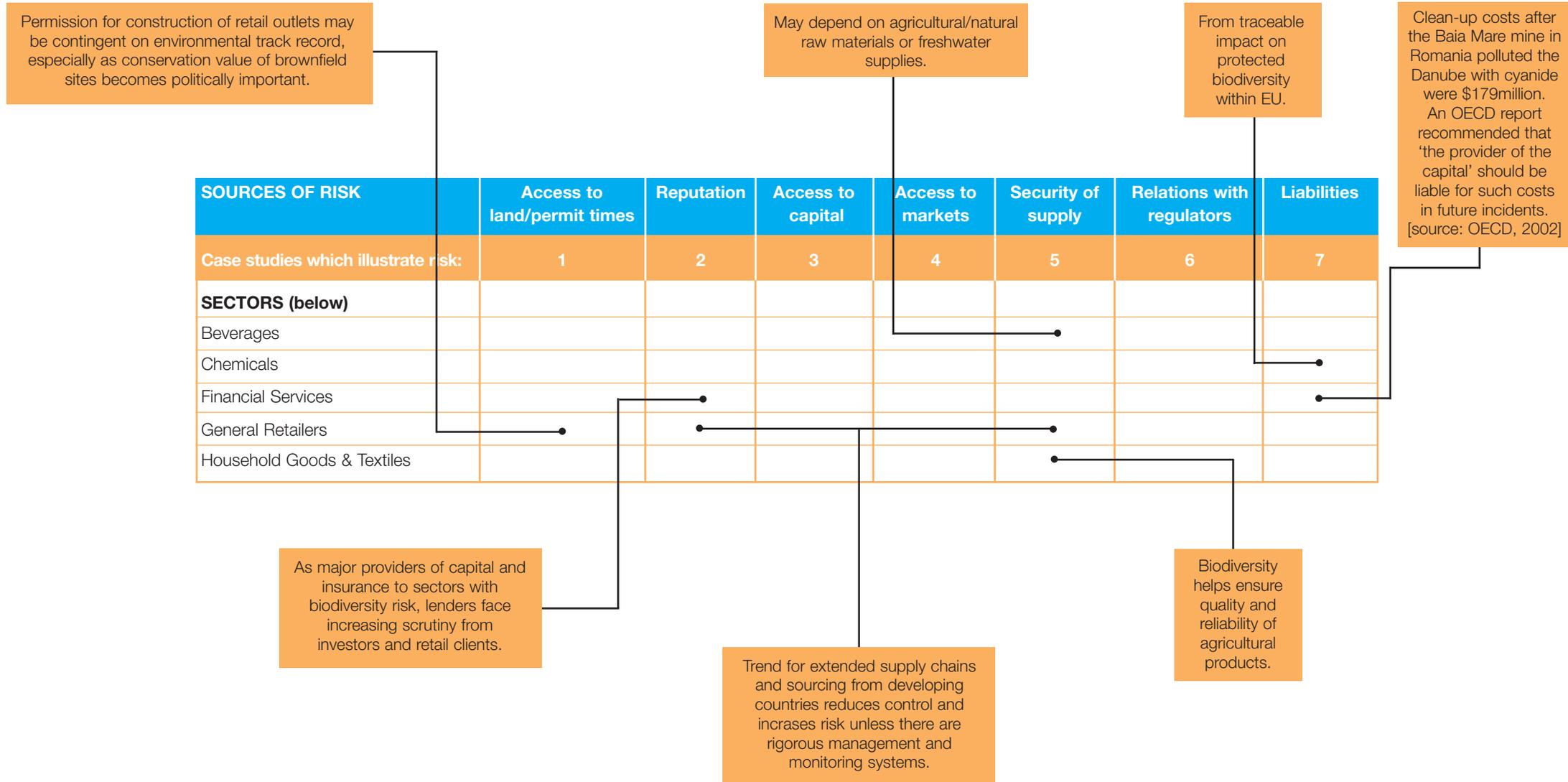


Table 4 continued

A major company in this sector proposes to establish its new global headquarters at a site bounded by ancient woodland and within the protected Chilterns greenbelt and Area of Outstanding Natural Beauty. The new buildings feature local materials, energy efficiency and careful siting to avoid visual intrusion. A green transport plan will manage traffic movements. An already agreed woodland management plan designed to protect and improve the woodlands and supply chippings to a local wood fired boiler is also a feature. Despite the sensitivity of the location, the plans have received widespread support from the local community including conservation bodies such as the Chiltern's Society and the AONB office. The companies track record of delivering biodiversity on local farmland it owns and its long established links to the local community and a nearby environmental education centre are felt to have contributed strongly to creating this support. The proposals have to date been refused by the planning authority as they are in breach of its strict green belt protection policy. However, the company believes that it has a good prospect of winning an Appeal and that its good standing in the community and track record in conservation and environmental management will be a factor in this.

Good environmental management can improve reputation and relations with regulators, giving companies credibility when in discussions with policy makers. Poor relations with regulators can mean that companies suffer from onerous regulation. 'For tobacco, policy making can flout accepted good regulatory practice. Laws can go far beyond what is reasonable and can seem to be 'cut and pasted' from pressure group proposals with little basis in sound science, cost/benefit or even basic notions of a fair society.'
Chairman of BAT, AGM speech 2004.

SOURCES OF RISK	Access to land/permit times	Reputation	Access to capital	Access to markets	Security of supply	Relations with regulators	Liabilities
Case studies which illustrate risk:	1	2	3	4	5	6	7
SECTORS (below)							
Personal Care & Household Products							
Pharmaceuticals & Biotech							
Support Services							
Tobacco							
Transport							

Land-take or infrastructure development activities require permissions that may be enhanced by good biodiversity track record.

The share price of Associated British Ports dropped by 12% in the week that the Department of Transport refused planning permission for a new port at Dibden Bay due to 'the environmental impact of the proposals on internationally protected sites.' In 2004, the company wrote off £44.9 million for the Dibden project, on an annual turnover of £252 million. [Source: Financial Times 2/9/04, ABP]

Corporate reputation could be affected by mismatch between the companies promotion of health and negative publicity over poor environmental management affecting human health.

Activist or pressure groups may use weakness in environmental management as leverage in anti-smoking debate.

Warwickshire Wildlife Trust is opposing development of Coventry Airport by citing Civil Aviation Authority safety rules on the proximity of airport to areas used by large birds. [source: Warwickshire Wildlife Trust, CAA]

Impacts of chemicals used in products on human health and biodiversity.

Downstream effects of products e.g. of endocrine disrupting hormones or microparticles.

Potentially serious negative impact of single big error in intellectual property rights relating to compounds derived from natural products.

Table 4 continued

Pollution through use and disposal of chemicals and toxic mineral components.

SOURCES OF RISK	Access to land/permit times	Reputation	Access to capital	Access to markets	Security of supply	Relations with regulators	Liabilities
Case studies which illustrate risk:	1	2	3	4	5	6	7
SECTORS (below)							
Aerospace & Defence							
Automobiles & Parts							
Diversified Industrials							
Electronic & Electrical Equipment							
Engineering & Machinery							
Health							
Information Technology Hardware							
Media & Entertainment							
Software & Computer Services							
Steel & Other Metals							
Telecom Services							

The telecommunications sector is highly competitive with tight profit margins. Extent of network coverage is one of the key things influencing consumer preference between networks. With an increasing need for base stations in rural locations, A major UK telecoms company is taking part in an industry-wide initiative to develop guidelines around siting of base stations, to ensure that the company will have early warning of any possible sensitivities, and be well prepared to manage these or to seek alternative sites.

6. Case Studies – how companies view biodiversity risks

In order to give insight into how biodiversity can present risks to business, and to give an indication of possible financial value of the risks, we have carried out detailed case studies with nine companies.

The findings from the case studies are presented in this section under the seven risk headings identified in section 5.

6.1 Key findings from case studies

The case studies highlight ways in which biodiversity may be material to a company.

In rare cases, it has been possible to put a financial value on this. For example, building materials supplier Travis Perkins estimates that it supplies around £60 million (2003) of timber for UK government projects, whose new procurement guidelines effectively require this to be sustainably sourced. Failing to address biodiversity concerns, via sustainable timber certification, could prevent Travis Perkins from accessing this important market.

In other cases, it has not been possible to put a specific financial value on biodiversity-related risks. Sometimes, this has been because companies were unwilling to disclose these figures; in others, it was not possible, or not considered sensible, to do so. Nevertheless, in many of these cases, companies interviewed specifically told us that the risks were likely to be material to them and that they were managing them accordingly.

TYPE OF RISK: Access to land**EXAMPLES OF SECTORS TO WHICH THIS RISK IS RELEVANT**

Forestry & Paper; Mining; Oil & Gas; Utilities; Electricity; Construction & Building Materials, Leisure & Hotels.

CASE STUDY

Rio Tinto (Mining) is one of the world's largest diversified mining companies with operations in five continents. The company wholly owns the **Kennecott Minerals Company**, operator of the Flambeau copper mine in North America. As with many new mining sites, Kennecott's initial plans for Flambeau in the mid-1970s generated local controversy, which highlighted the importance of adopting a responsible approach in order to gain access to the land for mine development. Baseline studies were done over three years starting in 1987 and permits granted in January 1991 for an intensive five-year extraction programme.

BIODIVERSITY RELATED ACTIVITY

Community and licensing authority concerns over the Flambeau plans centred on the potential destruction of an area of local amenity and landscape value with high-levels of biodiversity. In addition, to wishing to appoint a responsible operator for the site, the permit authorities for Flambeau set biodiversity performance standards for reclamation of the site.

Rio Tinto has established a track record and reputation as a best practice operator regarding biodiversity and reclamation, aiming to demonstrate that it is a reliable and responsible operator. This will help to make it an 'operator of choice' in future access to land debates. The Group's biodiversity principles state that it "*aims to have a net positive effect on biodiversity ...in the regions in which it operates.*" These business principles are integrated at a site-level throughout its operations. This may involve investing resources to understand differences that exist between perceptions of traditional tenure and statutory law. Access to land issues may involve ongoing consultation with local people, public authorities and others affected, which sometimes results in not exploring land or developing operations, even if legally permitted to do so.

At Flambeau, the company needed to gain support from both the permit authorities and the local community, whose opposition could have caused the project to be delayed or scrapped. This was helped by both the Group's track record, and its ability to demonstrate that it had the expertise and resources to undertake reclamation commitments to make the site safe post-operation and restore the site's biodiversity.

Reclamation provisions in the permit included a commitment to restore a minimum of 15 native plant species in grasslands and woodlands and a minimum of 12 native plant species in wetlands. In addition, 73 hectares of the site were set aside for conservation during the mine's operation, and bald-eagles were monitored to ensure they were not affected by blasting.

Following complete backfill of the pit in 1997, Kennecott went significantly beyond compliance, and 2003 records show that there are 267 native species at the site. The lower quality wetlands that were removed by mining were replaced by high quality wetlands that now contain 153 native plant species. Kennecott also took an extra step by partnering with local community conservation groups and constructed nature trails on the reclaimed mine site that have been open to the public since 2001.

The company's understanding of biodiversity also meant it was able to respond swiftly when, after permits were granted, Wisconsin state – the permit authority – changed its requirements for the Flambeau's wastewater content because new information came to light about the presence of threatened clam and dragonfly species in the adjacent river. The company undertook a supplemental impact study and more stringent wastewater permit standards were agreed.

NATURE OF RISK

The risk for Flambeau specifically was that the operating permit would not be granted, and that the permit might be revoked or fines imposed if biodiversity-related standards were not met during operation.

The permit authority had the option to postpone granting the licence if it had not believed that Kennecott would be a responsible operator, a risk that would have been heightened by sustained opposition from the local community. Equally, the permit authority might have decided that no mining should take place at Flambeau, or built in such a large margin for error in environmental standards that the project would have become uneconomic. Any of these scenarios would have led Kennecott to write off its exploration and development costs; for an average mining development these are tens, and sometimes hundreds, of millions of dollars.

At Rio Tinto Group level, the long-term business case for biodiversity is articulated as:

- Improved licence to operate granted by neighbours, regulators and society;
- better resource development opportunities; and
- better access to markets for products".⁴²

Rio Tinto recognise the benefits that good practice has conferred at Flambeau, and is transferring the reclamation lessons from Flambeau to other similar sites both in the US and elsewhere.

FINANCIAL RELEVANCE

Kennecott was able to gain and retain access to the Flambeau site due to its credible commitments over responsible behaviour and reclamation. The setting of targets and monitoring by the licensing authorities meant that at any time the permits could have been revoked if the company failed to meet its targets for water quality, conservation or reclamation: continued access to land is therefore contingent on good performance. In all areas of its activities at Flambeau, the company set internal standards that were beyond minimum legal requirements. This enhances the company's and the site's reputation with local community groups and regulators.

The Flambeau mine generated revenues (net sales) of \$341 million from direct shipment of ore during its planned five years of operation and generated a return on capital that fully met the Group's requirements; the mine was closed in 1997, at which point reclamation started. Reclamation costs for the site are estimated to be \$20 million over the full life-cycle of the project. In addition, Kennecott will monitor the Flambeau site for 40 years after receipt of a Certificate of Completion demonstrating completed reclamation, at marginal additional cost

In the broader context, by building a track record of excellence and community support at sites like Flambeau, the Rio Tinto Group believes it will reduce delays and enhance access in future projects when access to land is controversial or it is competing for a licence with a less responsible operator. A one year delay can cost millions of dollars in additional costs during an exploration phase, delays the return on capital and means that the company has less flexibility in exploiting fluctuations in world commodity prices. In the future, Rio Tinto believes that access to land will be a critical issue for the mining sector as usable sites outside ecologically-sensitive areas become exhausted, requiring more mining inside ecologically-sensitive areas. A recent report noted that "three quarters of active mines and exploratory sites overlap with areas of high conservation value and areas of high watershed stress."⁴³

KEY FEATURES COMMON TO OTHER BUSINESSES

Site-dependent projects or infrastructure requiring permits or community consent for licence to operate: e.g. telecoms masts, extractive projects, pipelines, factories needing access to water and transport network, ports.

⁴² Rio Tinto Group Biodiversity Principles.

⁴³ Mining and Critical Ecosystems: Mapping the Risks [World Resources Institute, Washington, 2003].

TYPE OF RISK: Reputation**EXAMPLES OF SECTORS TO WHICH THIS RISK IS RELEVANT**

Food & Drug Retailers; Food Producers & Processors; Mining; Oil & Gas; Utilities; Electricity

CASE STUDY

Marks & Spencer (General Retailers) is one of the largest clothing retailers in Europe, with around 12% of the UK clothing market. It has 10m customers a week in 300 UK stores and buys in 30 countries worldwide. The Group's annual turnover is over £8 billion.

BIODIVERSITY RELATED ACTIVITY

Typical of most large retailers, Marks & Spencer (M&S) sources products from all over the world. Many products come from natural raw materials, including fish, meat, fruit, vegetables, cotton, wool and wood, each of which have biodiversity impacts in the way in which they are grown or harvested. For example cotton, which provides around 50% of all the fibre used by M&S, can be one of the most intensively grown and environmentally damaging crops. Cotton is less than 1% of global agricultural output but is responsible for up to 25% of global insecticide use and 12% of global pesticide use; many of the chemicals used have been banned in Europe because of the risk they pose to human health and the environment. Large volumes of water are required for irrigation, which affects local and downstream ecosystems.

NATURE OF RISK

Consumer brands are built on trust and a reputation for the quality of their products. Concerns over product origins and production methods can undermine consumers' trust and perceptions of product quality, leading to loss of sales and reputation damage – particularly when there is a link to human health. The supply chains of many large retailers are likely to harbour a number of potential issues of this nature, because of the number and diversity of products involved. Repeated negative publicity is likely to undermine the trust and loyalty of customers, even on non-health issues.

Consumer companies are therefore vulnerable to high-profile campaigns or negative media coverage. In the case of cotton, a coalition of conservation and humanitarian NGOs is currently working with the cotton industry to promote good practice. At least one major global biodiversity NGO is involved, highlighting the impacts of cotton, via intensive water and pesticide use, on biodiversity and ecosystems.⁴⁴ If little progress is made as a result of this constructive engagement, previous experience shows that NGOs will rapidly turn to public campaigning on the issues.

To address biodiversity concerns, M&S is identifying and focusing on high-impact areas of the supply chain, including wood, fish and cotton. M&S has taken an industry-leading approach on cotton, committing to making all cotton products with a 5% blend of organic cotton.^{45, 46} This may turn the risk into an advantage for M&S, which should be able to demonstrate that it is performing better than its competitors on this issue.

FINANCIAL RELEVANCE

Immediate impacts of negative publicity on product sales are most likely to arise from concerns over the quality and safety of food – for example, in early 2004, concerns over levels of toxins in farmed Scottish salmon led to a significant short-term decline in sales of salmon in the UK. Such human health concerns are often intertwined with biodiversity issues: for example, the 'salmon' toxins are also a significant threat to marine biodiversity. Conversely, consumer confidence in the health and quality of products can be a competitive advantage.

KEY FEATURES COMMON TO OTHER BUSINESSES

- Customer-facing companies relying on trust in brand and quality of products.
- Companies with broad and diverse supply chains, especially relying on agricultural and other biological raw materials.
- Brands based on quality and health-properties of the products, due to both real and perceived links between good agricultural practice and quality and 'vitality' of food.

⁴⁴ WWF's 'business and agriculture' strand of its 'freshwater' programme.

⁴⁵ Organic cotton is produced without the use of synthetic pesticides & fertilisers and has a reduced water demand.

⁴⁶ This will require, and therefore support, an increase in world organic cotton production.

TYPE OF RISK: Access to capital**EXAMPLES OF SECTORS TO WHICH THIS RISK IS RELEVANT**

Construction & Building Materials; Electricity; Food Producers & Processors; Forestry & Paper; Mining; Oil & Gas; Utilities; Leisure & Hotels.

CASE STUDY

Barclays (Banks) is a UK-based financial services group engaged in commercial and investment banking and investment management activities worldwide.

BIODIVERSITY RELATED ACTIVITY

Barclays provides finance to major projects such as construction and mining, and commercial loans to a wide range of sectors including manufacturing, chemicals and retail. Potential impacts of these financed activities on biodiversity include habitat loss and pollution.

NATURE OF RISK

In calculating the viability of a project for financing purposes, Barclays uses environmental credit risk assessment policies and procedures. These factor environmental issues into loan risk profiles as part of the evaluation and sanctioning process, and take into account the potential for environmental risks to impact upon the financial status of the company or project, including its repayment ability. Factors relating to biodiversity which influence this include:

- likelihood of change to budgeted number of operating days
- likelihood and duration of delays or suspension of operating permits
- potential for pollution and likely impact and mitigation costs of a pollution event.

However, there are some projects or businesses to which the bank would not lend at any price. The newly-developed Equator Principles, which Barclays and 22 other international banks have adopted, commit banks to ensuring that borrowers have developed their projects in a manner that is socially responsible and reflects sound environmental management practices. The Principles specifically cite the protection of biodiversity, including endangered species and sensitive ecosystems, as examples of issues which must be addressed. The adopting banks recognise that the reputation of the bank and the borrower are inextricably linked.

Barclays was one of the first banks to establish a dedicated central environmental risk management team to advise on such assessments, and more banks are developing similar functions in response to the Equator Principles and other business drivers. It is likely that the resulting rigour of environmental assessment used in project finance will be used in other credit risk assessments, as happens at Barclays.

The risk for companies not managing biodiversity exposure adequately is that capital will be harder to access or increase in cost. Companies in certain sectors will increasingly need to demonstrate that they are operating to acceptable biodiversity standards in order to borrow from “Equator” banks. If loans are declined by those banks, a company seeking to borrow elsewhere may be regarded as higher risk by other lenders and face an increased cost of capital.

FINANCIAL RELEVANCE

A senior risk manager at Barclays told us: *“SEE factors are one of the bases on which we assess the overall quality of management of the company or project. These issues are definitely material – but we cannot price them. Barclays would not make a loan if we were not satisfied that significant biodiversity risks were being managed properly. Following initiatives such as the Equator Principles, we expect many more banks to make similar judgements.”*

KEY FEATURES COMMON TO OTHER BUSINESSES

Companies needing corporate loans and project finance:

- which purchase or lease land;
- for activities which may impact biodiversity, e.g. infrastructure/construction or manufacture or use of chemicals;
- which use biological resources in production, or which rely on biodiversity (e.g. for aquarium fish or tourism) for a their business model.

TYPE OF RISK: Access to markets**EXAMPLES OF SECTORS TO WHICH THIS RISK IS RELEVANT**

Food Producers & Processors; Forestry & Paper; Oil & Gas; Food & Drug Retailers; Construction and Building Materials; Leisure & Hotels.

CASE STUDY

Travis Perkins (Construction & Building Materials) is the UK's largest supplier of building materials with over 700 branches throughout the UK and a turnover of £1.7 billion.

BIODIVERSITY RELATED ACTIVITY

Travis Perkins sells over £300m worth of timber and timber-based products each year. A combination of illegal and unsustainable logging is a major contribution to forest destruction and biodiversity loss in some of the most important ecosystems around the world.

NATURE OF RISK

In January 2004 the UK government updated its timber procurement policy,⁴⁷ now requiring government timber purchases to be legally logged and traded, and, where financial considerations support it, also to choose suppliers which can provide timber from 'sustainable' sources.

This means that government contractors – including, for example, those working on infrastructure and PFI projects as well as refurbishment of government buildings – are being asked to buy timber from sustainable sources. Contractors tend to buy as many supplies as possible in one place, so the yard which can provide sustainable timber will also make sales of other building materials. In order to meet this stringent requirement, Travis Perkins has therefore obtained chain of custody certification for timber sold at its major branches.

FINANCIAL RELEVANCE

Approximately 15-20% of Travis Perkins' total timber sales, or up to £60m in 2003, are estimated to be sold for use in government-related building projects each year. The actual figure may be even higher when indirect sales are taken into account (i.e. those sales for which Travis Perkins is unaware of the ultimate destination). Without a system for sourcing sustainable timber, and the ability to track it through the supply chain, the company would be at risk of losing access to the important government procurement market.

The cost of implementing FSC chain of custody certification is approx. £10,000 in external fees. It has also required a considerable amount of investment of internal management time to put the system in place.

KEY FEATURES COMMON TO OTHER BUSINESSES

- Being part of the supply chain of a major customer (government or big company), which are increasingly establishing environmental standards (e.g. timber to be from proven legal or sustainable sources).
- Sourcing timber or timber-containing products including buildings, paper and cardboard packaging.
- Transporting timber or other natural resources between markets, where legal requirements in importing markets prevent the import of goods even though they may have been produced legally in their country of origin.
- Companies involved in PFI contracts.

⁴⁷ <http://www.sustainable-development.gov.uk/sdig/improving/partf/greenbuy/pdfs/24a.pdf>

TYPE OF RISK: Security of supply**EXAMPLES OF SECTORS TO WHICH THIS RISK IS RELEVANT**

Food Producers & Processors; Forestry & Paper; Mining; Oil & Gas; Utilities; Electricity; Tobacco; Food & Drug Retailers; Construction and Building Materials.

CASE STUDY

Unilever (Food Producers & Processors) is an Anglo-Dutch producer of food and home and personal care products with worldwide turnover in 2003 of £42.9 billion. Frozen fish sales represent around 2% of Unilever's total sales.

BIODIVERSITY RELATED ACTIVITY

Fish is a major part of the frozen foods market and is an image leader for Unilever's Bird's Eye brand. UK consumers have a strong preference for cod, which is the main fish used in all premium products. Unilever buys 5% of the world cod supply; this has remained roughly the same since the early 1990s - although Unilever has reduced its use of cod, world supplies have also declined.

NATURE OF RISK

A high-proportion of fish stocks around the world are declining, with two-thirds of the world's fisheries being fished at or above their maximum capacity.⁴⁸ Canadian Atlantic coast cod stocks collapsed in the early 1990s and have not recovered; cod fisheries closures are in place or proposed in the North American, Baltic and North Seas. Restricted supplies of cod leads to higher prices.

Unilever reacted quickly to this fundamental challenge to its frozen fish business. It has sought to use alternative fish species in its products, worked with WWF to help establish sustainable fisheries through the Marine Stewardship Council (MSC) and set a target to source all fish from sustainable fisheries.

Although it is possible to use alternative fish species in frozen fish products, and Unilever has sought to do so, as sales of these second-tier products have increased, market share of the leading products has declined.

FINANCIAL RELEVANCE

Price rises due to restricted supply have contributed to continued pressure on sales for Unilever's cod products. Cod prices have increased substantially since the early nineties and by over 50% between 1996 and 2000. Approximately 30% of this additional cost was absorbed by the company in reduced margin, a further 30% being absorbed by the trade and the balance passed on to consumers.

A decline in market share for cod products has been compensated by sales of other frozen fish products. However, established consumer preferences lead to the perception that these are 'lower' quality products, they therefore have a lower profit margin than premium pure cod products.

Unilever continues to engage in dialogue with key stakeholders in international fisheries, including the MSC, through its Fish Sustainability Initiative. This will help to protect the company against future declines in fish supply stocks.

KEY FEATURES COMMON TO OTHER BUSINESSES

- Direct users of wild biological resources vulnerable to over-harvesting including fish and tree species.
- Indirect users of biodiversity such as the tourism destinations which rely on marine species and habitats or wildlife populations which are also harvested for food and decorations.
- Companies sensitive to reputational damage that may arise by association with regions or suppliers targeted over concerns about unsustainable use of biodiversity.
- Users of water or other resources which compete with biodiversity needs.

⁴⁸ <http://www.wri.org/wri/trends/fishloss.html>

TYPE OF RISK: Relationships with regulators**EXAMPLES OF SECTORS TO WHICH THIS RISK IS RELEVANT**

Food Producers & Processors; Forestry & Paper; Mining; Oil & Gas; Utilities; Electricity; Tobacco; Food & Drug Retailers; Construction & Building Materials.

CASE STUDY

Carillion (Support Services and Construction) operates in the UK, Canada, the Middle East, France, Scandinavia and the Caribbean, providing rail and road infrastructure services, facilities management and support services, as well as construction, including building hospitals, prisons, offices, retail and mixed use developments, high-rise urban residential developments and schools. The company's annual turnover is £1.9 billion.

BIODIVERSITY RELATED ACTIVITY

Construction projects, on both brown-field and green-field sites, and including building and infrastructure projects, have the potential to damage biodiversity through loss of habitat and disturbance both during construction and over the lifetime of the development. Many species and habitat are protected by national legislation.

NATURE OF RISK

Companies that fail to avoid or carefully manage impacts on biodiversity can incur fines and other costs to their business from poor relations with regulators in addition to potentially restricting access to land (case study 1). For example, unauthorised damage and disturbance to protected species and habitats can result in fines, loss of management time in dealing with prosecution and negative publicity. Companies may find themselves disadvantaged over competitors in getting future contracts from government, and may face difficulties in working with planning authorities.

Carillion has noted that many of its clients, in both the public and private sectors, have public commitments to biodiversity. In response, it has developed internal biodiversity guidance tools, identifying how the company's activities can impact on biodiversity, and explaining how biodiversity can be integrated into the company's management systems. It also intends to "develop and trial biodiversity action plans", initially on one new PFI project and one new road project.

A senior policy advisor at English Nature has told us:

"Regulators and government bodies, such as English Nature, are most concerned about protecting the environment and biodiversity. We will prosecute companies if necessary, but we would prefer to work constructively with them to ensure that nature is not damaged in the first place. Companies which are taking a positive, responsible approach to preventing damage, and looking for opportunities to enhance biodiversity, are more likely to find support and understanding from regulators such as ourselves."

"We would expect a company to be able to demonstrate that it understands the issues it faces, has processes to manage them and has embedded these in existing management systems. We would also look for evidence that the board has access to appropriate skills and sources of information to enable good decision making".

FINANCIAL RELEVANCE

Companies with good management systems and track records are able to fulfil increasingly stringent biodiversity requirements from clients – who are often in the public sector - and regulators, helping to win contracts. Poor relations with regulators lead to fines rather than constructive resolution of disputes and, more importantly, costly project delays.

Carillion told us: *"Understanding biodiversity - and having effective systems in place to ensure that we properly identify, manage and mitigate our impacts on it - helps us to win contracts ahead of our competitors. The benefits of offering integrated sustainable solutions go beyond statutory compliance and minimising risk: for example, by reducing the likelihood of planning and project delays due to unexpected impacts, including those related to biodiversity."*

For example, the relocation of a protected species not identified in the project planning would hold up work on a construction project for a month or more. This could cost the company approximately £200,000 per week on a £100 million project, plus the cost of any time-related penalty clauses in the contract.

KEY FEATURES COMMON TO OTHER BUSINESSES

- Heavily regulated industries.
- Companies involved in or requiring infrastructure development.

TYPE OF RISK: Liabilities**EXAMPLES OF SECTORS TO WHICH THIS RISK IS RELEVANT**

Food Producers & Processors; Mining; Oil & Gas; Utilities; Electricity; Construction & Building Materials

CASE STUDY

BP Chemicals (Oil & Gas), a subsidiary of BP Group, is the world's largest producer of PTA (used to manufacture polyester and resins for use in packaging). It also produces raw materials for plastics and other products for applications ranging from pharmaceuticals and cosmetics to fuel additives and cable insulation. In 2003, BP Chemicals' turnover was \$16,075 million.

BIODIVERSITY RELATED ACTIVITY

Some chemicals become pollutants which threaten biodiversity by reducing survival and reproductive rates of populations.⁴⁹ Higher concentrations of chemicals can also kill individual plants, animals and other organisms. Many of these impacts also affect human health.

NATURE OF RISK

BP believes that chemicals manufacturers are increasingly likely to be held liable for the effects of their products on human health and the environment. There are three particular factors which lead to biodiversity-related liabilities risks for companies like BP:

First, the EU Environmental Liabilities Directive⁵⁰ will hold polluters responsible for damage to species and habitats protected by EU legislation (covering 980 species and 14% of the EU land area). This places a new importance on establishing the baseline status of biodiversity in areas owned, managed or impacted by the company. In future, the Directive may also establish a wider definition of 'biodiversity damage' beyond that already given legal protection.

Secondly, a proposed new EU regulatory framework for the registration, evaluation and authorisation of chemicals (REACH)⁵¹ will reverse the burden of proof by making the chemicals industry responsible for generating and providing the necessary information to demonstrate that their products are safe for human health and the environment. Companies may face restrictions on the manufacture, use and marketing of their products if data on their impacts are inadequate or incomplete, and an approval based on incorrect test data (e.g. which failed to identify impacts on biodiversity) could be withdrawn, potentially leading to product liability litigation and other costs.⁵²

Thirdly, EU-based companies operating outside the EU may need to adhere to these standards because they set a benchmark for good practice against which companies could be held responsible when operating in other countries. In what has become known as 'foreign direct liability',⁵³ a number of companies have been held liable in their home country for the negative impacts of their operations elsewhere in the world, because they contravened established good practice.

FINANCIAL RELEVANCE

Potential liabilities are difficult to assess – both in terms of the amounts at stake and who will be liable for these. Under the EU Environmental Liabilities Directive, no limit is set – 'operators' may be held financially liable for remedying damage. Clean up after the spill of toxic mine waste into the Doñana Natural Park in Spain cost Spanish authorities €240m.⁵⁴

A senior risk manager at BP chemicals told us: *"We believe that companies could be held liable, in the EU and beyond, for their impacts on specific aspects of the environment, such as biodiversity. For this reason, BP Chemicals is developing and using best practice in its operations around the world and sharing this with users of its products. At several of our Chemicals sites, we have prepared Biodiversity Action Plans to help formalise our biodiversity management activities, with the result that we have improved our understanding of the baseline biodiversity in and near to our sites, and in some cases have contributed to projects that have directly benefited biodiversity. For example, at our PTA plant in Decatur, Alabama, USA, we support environmental education programmes for the local school district and in Terengganu, Malaysia, BP has been instrumental in protecting the Ma'Daerah sea turtle nesting beach and promoting much-needed research in cooperation with local regulatory agencies and a local environmental non-governmental organisation."*

KEY FEATURES COMMON TO OTHER BUSINESSES

- Manufacture or use of chemicals which may potentially have negative impacts on the environment and biodiversity over the long-term
- Risk of one-off pollution incidents resulting from handling and use of chemicals or from storage of other toxic material, e.g. mining waste.

⁴⁹ For example, due to depressed immune function and reproductive abnormalities.

⁵⁰ Directive 2004/35/EC entered into force on 30 April 2004; member states must implement in national law by 2007.

⁵¹ <http://europa.eu.int/comm/environment/chemicals/reach.htm>

⁵² REACH – implications for the chemicals industry [Freshfields Bruckhaus Deringer, December 2003].

⁵³ Governing multinationals: the role of foreign direct liability. [Ward, H. RIIA briefing paper new series no. 18, Feb 2001].

⁵⁴ FAQs on Environmental Liabilities Directive at <http://europa.eu.int/comm/environment/liability>

7. Assessing and managing exposure to biodiversity-related risks

7.1 Why are companies not managing biodiversity risks better?

There are particular challenges in identifying and managing biodiversity risks due to:

- Poor understanding of the risks: as outlined in this report, biodiversity risks are manifested in many different guises and the terminology is confusing; there is in general a low level of understanding by senior management and environmental or HSE managers about the risks they may face.
- The complexity of the underlying issue – in scientific terms, ecology is a complex and only partially understood subject [see box 4].
- The wide geographical area which biodiversity impacts from a company may be felt, or which may be causing negative impacts on a company's operations – which makes it difficult to assess and assign responsibility.
- The problem of establishing a cause-effect relationship between biodiversity and business activities, and establishing responsibilities when the impacts are secondary.
- Lack of standard responses to biodiversity management – for example, the ISO 14001 environmental management standard can encompass biodiversity, but often does not.
- The difficulty of meaningful measurement of biodiversity impacts and progress towards effective biodiversity management.
- Long timescales that may be needed to both assess the risks, and put in place the processes needed to manage them; it is noteworthy that the time horizons over which biodiversity issues may affect a business are sometimes longer than those encompassed by conventional business planning or risk assessment tools.
- Exposure to risks as a result of bad practice by others in the sector.

7.2 Identifying biodiversity risks

The complexity of biodiversity means that to identify and assess the significance of their biodiversity risks, companies will need to:

- Examine direct and indirect impacts (the so-called secondary impacts) over a wide geographical area.
- Deal with impacts which are known to take place, but cannot be measured or wholly attributed to the company at present.
- Consider the dependence of other stakeholders on biological resources for their livelihoods and quality of life.

This may require companies to:

- Interact with local communities, governments and NGOs.
- Find acceptable solutions and trade-offs through inclusive negotiations with all stakeholders.
- Support basic scientific research on which to base these dialogues.
- Potentially, collaborate with other companies in the sector to avoid the 'weakest link' affect damaging good performers.

Companies are therefore likely to need to go beyond their standard environmental management systems and the traditional physical boundaries when identifying, assessing and managing biodiversity risks.

BOX 4

Ecological uncertainty makes risk management difficult

Some of the ecosystem services provided by biodiversity are listed in box 2. However, it is generally not known which species are important for particular ecosystem functions. This means that it is difficult for ecologists and governments to understand how to manage biodiversity. Such uncertainty can in turn create problems for companies: it is difficult for them to make precise management judgements about how to reduce or manage their impacts. Conservationists often err heavily on the side of the precautionary principle, which can stifle the economic aspect of sustainable development.

An additional effect of this ecological uncertainty is the difficulty of measuring progress in managing biodiversity. Species variety and abundance are among the few areas of biodiversity that can be measured quantitatively, but are usually impractical measures for companies and may produce data which are impossible to interpret.

Climate change is another major factor affecting biodiversity: the climate is changing at a faster rate than the natural adaptation of most species. In some areas biodiversity is being lost as a result of climate change – and in other areas, certain species are thriving to an unprecedented degree, leading to significant ecological imbalances. Companies should note that, even if other factors are addressed, climate change will drive changes in biodiversity and may lead to further unforeseen biodiversity risks.

7.3 Biodiversity Action Plans

An approach to biodiversity management at site level is to implement a Biodiversity Action Plan (BAP). This is a plan that specifically seeks to identify the site's biodiversity risks by examining a variety of factors such as the potential secondary impacts, and outlines the process by which those risks will be managed. This can be helpful in cases where the standard Environmental Management System (EMS) would not pick up all the biodiversity related risks.

Typically, this might be the case where the risks are social rather than environmental, relate to secondary impacts, cover a geographical area well beyond individual sites' boundaries, or there is no clear cause-effect relationship between the company's operations and biodiversity-related risks. Ideally, a BAP should form a sub-set of a site's EMS, such that the process, monitoring and targets can be re-integrated into the EMS.

In other words, the value of the BAP approach is often to allow companies at site level to ensure they have fully identified their biodiversity risks and are managing them appropriately. However, there are clear advantages in ensuring that the process by which the BAP is implemented is compatible with, and can be integrated within, the site's EMS.

Further information on BAPs and how they can link to an EMS can be found in publications from Earthwatch, IUCN and the World Business Council for Sustainable Development.⁵⁵

7.4 EMS integration

EMS certification processes, such as ISO 14001, tend to permit biodiversity to be encompassed within an EMS, but do not require it. This is one of the reasons why biodiversity needs to be paid special attention, to ensure that the related risks are not overlooked.

However, it is important that biodiversity should not be treated as a stand-alone issue. Having been through a process that allows specific biodiversity risks to be identified and analysed, the management of biodiversity should be integrated within, or at least fully compatible with, the company's EMS.

This has clear advantages, such as allowing consistent internal and external reporting on all environmental issues and ensuring that there is clear line management responsibility for biodiversity risks.

7.5 The challenge of measurement

A reason often cited for treating biodiversity as a stand-alone issue, and not integrating it within an EMS, is that it is difficult to measure progress. In this regard, it is similar to many social issues such as human rights that companies are grappling with.

For example, how should an oil company measure the gradual degradation of an ecosystem around its drilling operations? This may take place over thirty years and be within a fifty mile radius.

To date, most measurement has therefore been on process, such as the number of high-risk sites that have a BAP in place. For example, this is the approach taken by both the Business in the Environment Index and the proposed Mining supplement to the Global Reporting Initiative.

Part of the problem is that measuring the health of an ecosystem itself is extremely difficult, quite apart from the associated impacts and risks of a company. A standard method is to do a baseline survey of the flora and fauna within a given area and to undertake periodic monitoring of selected 'indicator' species. The advantage of this is that it can demonstrate when the numbers or health of an individual species has declined, which may be of great relevance when it is a flagship species upon which a company's operations are having an impact.

However, this approach also has several problems for companies: such surveys and monitoring are expensive and time-consuming; they require specialist expertise; they may require a 'control' site to be set up, further increasing costs; results are often inconclusive; and they may not address the wider issues of social impacts and ecosystem health that constitute a large proportion of the company's biodiversity risk. Moreover, even if a species is shown to decline at a site, this does not necessarily mean that it results from the company's activities.

⁵⁵ Business & Biodiversity [Earthwatch, Oxford, 2nd edition, 2001]; Business & Biodiversity: a guide for UK companies operating overseas, [Earthwatch, Oxford, 2002]; Business & Biodiversity: a handbook for corporate action [WBCSD, Geneva, 2002].

In other words, there will be circumstances in which extensive baseline surveys and regular monitoring of individual species are appropriate to a company's management of biodiversity risks; but just because species numbers are one of the few elements of biodiversity management that can be quantified or counted, it does not mean that is the answer to measurement for companies.

The next challenge, both for companies and the biodiversity conservation community, is to find a set of Key Performance Indicators (KPIs) that:

- Can be integrated into an EMS.
- Allow a company to measure its impact.
- Allow a company to assess whether its risks are changing.
- Allow a company to set realistic and appropriate targets for performance improvement that will manage or reduce its levels of risk.
- Satisfy other stakeholders that the full range of risks and impacts is being managed.

An interesting analogy is climate change. Energy use and Greenhouse gas (GHG) emissions are now widely accepted as proxies for a company's contribution to climate change. However, fifteen years ago, it was widely thought that companies would be unable to assess, and therefore unable to manage, their contribution to climate change.

7.6 Influencing public policy

Section 3 has outlined how the public policy debate on biodiversity is changing. This is manifested in areas such as the EU liabilities regime (see section 5.2.1). An effective long-term management strategy for those companies most likely to be affected by public policy changes may be to seek to influence the policy making. Companies that are not active in policy debates about biodiversity are more likely to be subject to policies that are not sympathetic to the particular challenges of their business. They may also be less well prepared to adapt to changes in public policy. Given the long time periods that are necessary to build up knowledge and implement a biodiversity strategy, this may place companies that are slow to react to their biodiversity risks at a competitive disadvantage.

Furthermore, companies cannot assume that they will be able to play an effective role in the policy making process, even should they try to do so. Existing participants in the conservation debate, such as governments and conservation NGOs, often do not see the private sector as a legitimate party to such discussions. Lobbying by companies in other areas has led to suspicion about the ways in which companies seek to exert their influence on policy makers.

Companies wishing to participate in and influence the policy debate will therefore need to establish their credibility by demonstrating a prior contribution to biodiversity conservation. They will also need to approach participation with transparency, being careful not to undermine public statements of support for conservation objectives.

In other words, influencing public policy may be an effective strategy for companies most likely to be affected by policy changes; and given the time needed to develop an understanding of the issues, companies should act now to establish their credentials for participating in any coming policy changes, and to ensure that they are not left behind by more proactive competitors.

7.7 What and where is good practice?

Many of the companies we interviewed, particularly those in our case studies, are managing biodiversity risks - even though they have not been able to put a financial value on these risks and the benefits of managing them. Often, they are not specifically defined or described by companies themselves as 'biodiversity' risks.

Previous analysis⁵⁶ has demonstrated that for companies to understand and properly address potential biodiversity risks may require an approach that goes beyond standard Environmental Management Systems (EMS) processes and risk analysis.

However, good practice does exist even though this is a relatively new area of social, environmental and ethical (SEE) risk management. At present, good practice is most commonly found in:

- The extractive sectors (mining, oil & gas and building materials) for which access to land is an issue of self-evident importance.
- Sectors that operate in well-regulated regimes, with short supply chains, such as the UK utilities.
- Individual companies that have decided to take a leadership role in this area, such as Marks & Spencer and Unilever.
- Companies that have faced specific biodiversity risks in the past and so have been sensitised to biodiversity issues.
- Companies that have established experience in managing relevant aspects of their business and are able to incorporate biodiversity consideration into a mature management system, such as the environmental credit risk assessment procedures at Barclays.

⁵⁶ "Where does your palm oil come from?" [ISIS Asset Management, London, 2003].

8. Recommendations

Assess

- All companies potentially exposed to high levels of biodiversity risk should **assess** whether these risks are material to their business.
- Companies in **red-zone sectors** should:
 - identify the source and nature of potential risks arising from their relationship with biodiversity, including direct and indirect impacts;
 - consider whether any of these risks, or combinations of risks, may be material now, or - in light of the trends highlighted in this report – could become material in the future
 - establish whether any such risks are being managed appropriately, and if not, put in place mechanisms to do so – bearing in mind the extended timescales that are often necessary for managing biodiversity risks.
- Companies in **amber-zone sectors** and **green-zone sectors** should:
 - identify any similarities between their business and characteristics of red-zone sector companies that give rise to potentially significant biodiversity-related risks
 - consider whether any of these risks, or combinations of risks, may be material now, or - in light of the trends highlighted in this report – could become material in the future
 - establish whether any such risks are being managed appropriately, and if not, put in place mechanisms to do so.

Develop Policy

- Companies with significant or potentially significant material biodiversity risks should **develop and publish specific policies** or statements that recognise the significance of the relationship between biodiversity and their business.

Manage

- Having identified significant risks, companies should put in place measures to **manage** these risks, including:
 - those arising directly from activities of the company
 - those arising indirectly from activities of the company, including supply chains
 - those caused by the mismanagement of biodiversity by others.
- Management of biodiversity should be integrated with the company's risk management systems, such as an EMS, and should set performance targets.

Report

- Companies exposed or potentially exposed to high levels of biodiversity risk should **report** on their management of biodiversity, including:
 - whether they have undertaken the steps outlined above
 - whether any of the risks identified were considered material
 - the action being taken to address these risks.
- An appropriate place to report is a CSR report or a company's OFR in the UK.

9. Conclusion: Should investors be concerned?

9.1 Is biodiversity a risk to business?

There is clearly a relationship between biodiversity and companies, arising from both direct and indirect impacts of companies on biodiversity, and from the reliance of companies on economically-valuable goods and services provided by the natural environment. This relationship gives rise to a number of key risks, all of which have the potential to affect companies financially. These risks arise through:

- Access to land
- Reputation
- Access to capital
- Access to markets
- Security of supply
- Relations with regulators
- Liabilities.

We conclude that:

- Companies that have the greatest relationship with biodiversity (ie, that have major or highly visible impacts through their operations, and/or rely heavily on ecosystem services provided by biodiversity for the supply of their products) will be most affected by these risks, and the growing relationship between business and biodiversity.

9.2 Are the risks material?

The risks are more relevant to some sectors than to others. The sectors in which the relationship between companies and biodiversity is most likely to lead to significant risks for most companies have been identified as our red-zone sectors (in alphabetical order):

- Construction & Building Materials.
- Electricity.
- Food & Drug Retailers.
- Food Producers & Processors.
- Forestry & Paper.
- Leisure & Hotels.
- Mining.
- Oil & Gas.
- Utilities.

We conclude that:

- Within these red-zone sectors, biodiversity risks will be more significant to some companies than others; but in most cases, the risks will be material and relate to the majority of companies.

9.3 Are companies aware of, and managing, their biodiversity risks appropriately?

We find that there is great variation in the level of awareness of biodiversity risks amongst sectors and companies in our red-zone sectors.

In four of the nine red-zone sectors, there appears to be a relatively low level of awareness:

- Construction & Building Materials.
- Food Producers & Processors.
- Forestry & Paper.
- Leisure & Hotels.

Within the red zone sectors:

- Some companies are generally aware of their risks, know if they are material, and are managing them accordingly
- Many companies are not aware of their risks, or are aware of possible risks but have not assessed their significance and therefore are not managing them appropriately
- In particular, the Leisure & Hotels sector appears to be poor at identifying and managing the potential risks.
- Closer analysis of **FTSE 100 companies** in the red-zone sectors suggests that about two-thirds are not managing their risks effectively.

Within the **amber-zone** and **green-zone** sectors:

- There are likely to be individual cases of companies with significant biodiversity risks, because some amber-zone and green-zone companies share characteristics with the red-zone sectors;

We conclude that:

- Many companies facing relatively high levels of biodiversity risk are not sufficiently aware of the risks they face.
- Companies that understand and manage their biodiversity risks will be better prepared to respond to changing public policy on biodiversity, and in particular if policy moves towards the internalisation of what are currently external costs

9.4 Summary

Our overall conclusions are that:

- **Biodiversity presents material risks** to companies in which ISIS invests, although putting a precise financial value on such risks is often not possible.
- Regulatory and market responses to biodiversity loss are likely to make biodiversity **increasingly significant** for companies.
- High levels of complexity and uncertainty about the relationship between companies and biodiversity make it **difficult for companies to assess** accurately their biodiversity-related risks.
- **Companies in four high-risk sectors are particularly exposed** due to apparently low levels of awareness.
- There are other companies, both in our red zone sectors and - although fewer in number - in our amber and green zones, that are **exposed to similar risks**, but they are not aware these risks, nor their potential significance, and are therefore not likely to be managing them appropriately.
- Among **FTSE 100 companies** in the nine red-zone sectors, a significant majority (our assessment suggests around two-thirds) are not taking substantive action to manage their biodiversity risks consistently or effectively.
- The long-term nature of biodiversity risks means that it can take an unusually long time to identify biodiversity risks, and it is **not easy to take rapid action** to mitigate them once they have been identified; this means that companies with potential risk exposure cannot assume that action can be postponed.
- The rating of FTSE sectors, the gap analysis of FTSE 350 companies, and the assessment of risk management among the FTSE 100 companies, are likely to be **directly relevant to companies in all markets**, even though the focus of this report has been the FTSE indices.
- Poor understanding or management of biodiversity risks on the part of companies should be of **concern to investors** in cases where the risks are likely to be material

Therefore:

- **This report should serve as an early warning to companies, particularly those in our red zone: start investigating and managing biodiversity-related risks now.**

Appendix A1. Methodology used to identify levels of risk

This section present the methods by which the results given in section 4 were reached.

A1.1 Experts' survey of level of sector impact on biodiversity

In October 2003 a workshop was held to bring together people with understanding and experience of business and biodiversity issues in order to ascertain:

- which sectors were felt to have the greatest biodiversity impacts;
- how these impacts, and related business risks, can arise.

Shortly afterwards, a survey was sent by email to a further group of 'experts' which were not able to attend the workshop.

Workshop participants and survey respondents were asked to identify areas of biodiversity impact which may affect the value of a company, as a result of both:

- the impact of companies on biodiversity
- the impact of biodiversity on companies

At the workshop, this list-building exercise was carried out in three smaller groups, each of which included representatives from the government, NGO and private sectors. Participants used post-it notes to provide comments about the activities or business processes of particular sectors related to biodiversity, giving us examples of potential risks for consideration during the project.

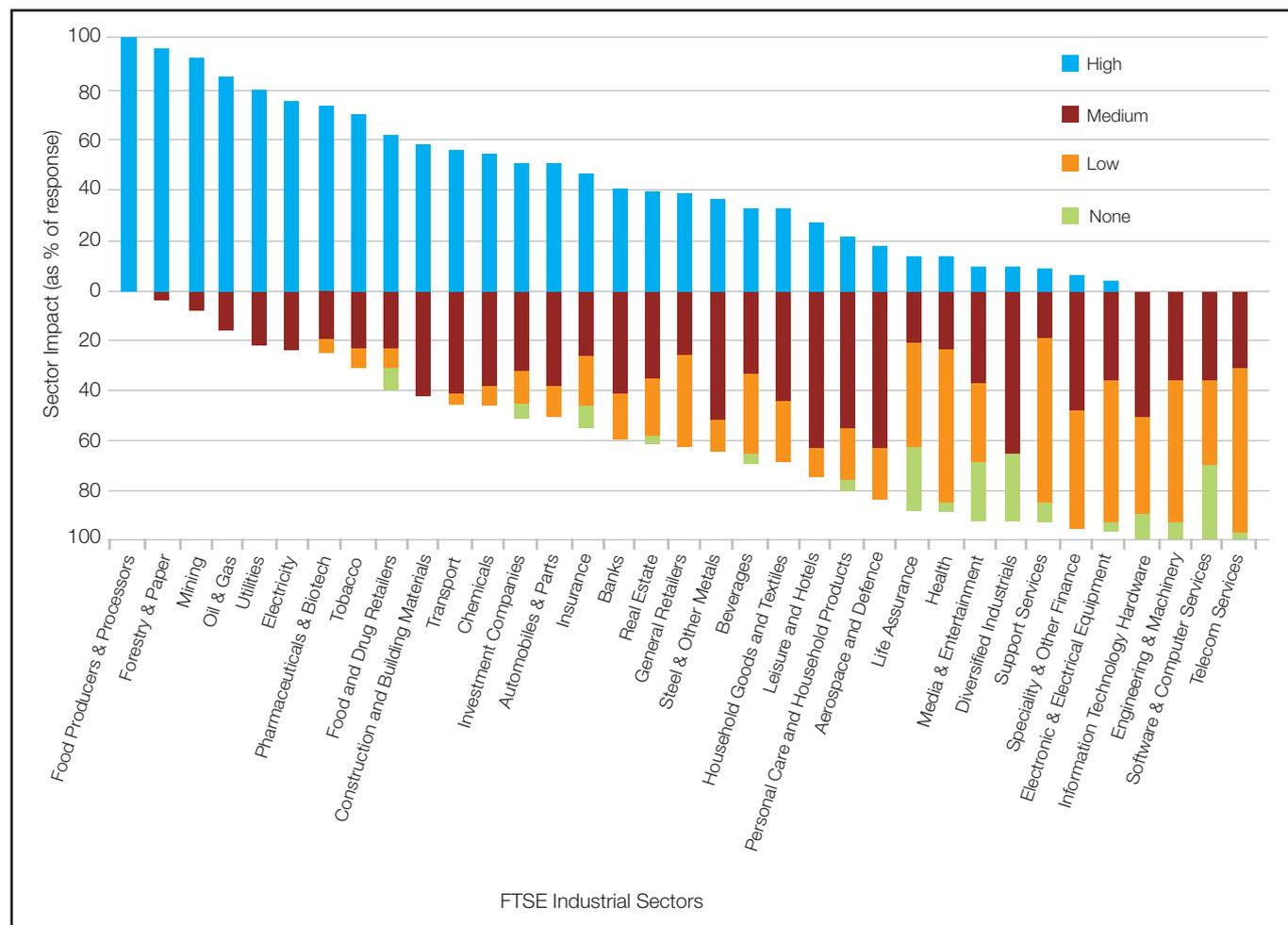
Key results of the surveys: Participants of the workshop, and respondents to the email survey, were asked to identify for each sector whether the biodiversity impact is likely to be high, medium, low or non-existent. The total number of participants assigning a level of impact to a sector was summed. The percentage of the total respondents giving "high", "medium", "low" and "no" impact were calculated respectively (chart A1).

Participants lists

Workshop and survey

John Groom	Anglo American
Nathalie de Geus	Aviva
Mark Goldsmith	CDC Capital Partners
Kit Armstrong	ChevronTexaco
John Robbins	DEFRA
Glenys Parry	DEFRA
Paul Steele	DfID
Jos Wheatley	DfID
Linda Brown	DfID
Hugh Speechly	DfID
Coralie Abbott	Earthwatch
Julian Laird	Earthwatch
David Hillyard	Earthwatch
Helen Doran	English Nature
Roger Mitchell	English Nature/Earthwatch
Rob Bowman	FCO, Environment Policy Division
Annelisa Grigg	Global Balance
Mark Eckstein	International Finance Corporation
Robert Barrington	ISIS Asset Management
Kirsty Sargent	ISIS Asset Management
Jeffrey McNeely	IUCN
Michael Kelly	KPMG
Paul Holthus	Marine Aquarium Council
Mike Barry	Marks & Spencer
Katie Stafford	Marks & Spencer
David Richards	Rio Tinto
Noel Morrin	RMC Group
Sachin Kapila	Shell International
Anniek Mauser	Unilever

Chart A1 Level of biodiversity impact. Percentage of experts taking part in our study who judged that companies in each sector had high, medium, low and no biodiversity impact, respectively. The percentage of respondents giving 'high' impact is shown above the line; percentage of respondents giving lower impact levels are shown below the line.



A1.2 Other evidence of biodiversity risks faced by sectors

In order to cross-check and build on the results of our experts' survey, we have considered other indicators of potential risks faced by companies in each sector. We assumed that one indication is given by the sectors which have been identified as priorities by parties concerned about the biodiversity impacts and risks of business, including investors, NGOs, governments, companies themselves and their industry bodies.

A1.2.1 Priorities identified by investors

Investor interest has thus far focused on the extractives sectors (mining, oil and gas, and sometimes construction and building materials) and utilities, on the grounds that these sectors are known to be faced with biodiversity issues, and a good deal of work has been done to draw out these risks.⁵⁷

ISIS has been looking at biodiversity issues for the extractives industries and users of palm oil, and most recently published a report in February 2004 which benchmarked the biodiversity performance of extractives-sector companies on managing biodiversity issues. Insight Investment published a similar report in May this year which also encompassed the UK utilities companies.

A1.2.2 Priorities identified by companies themselves

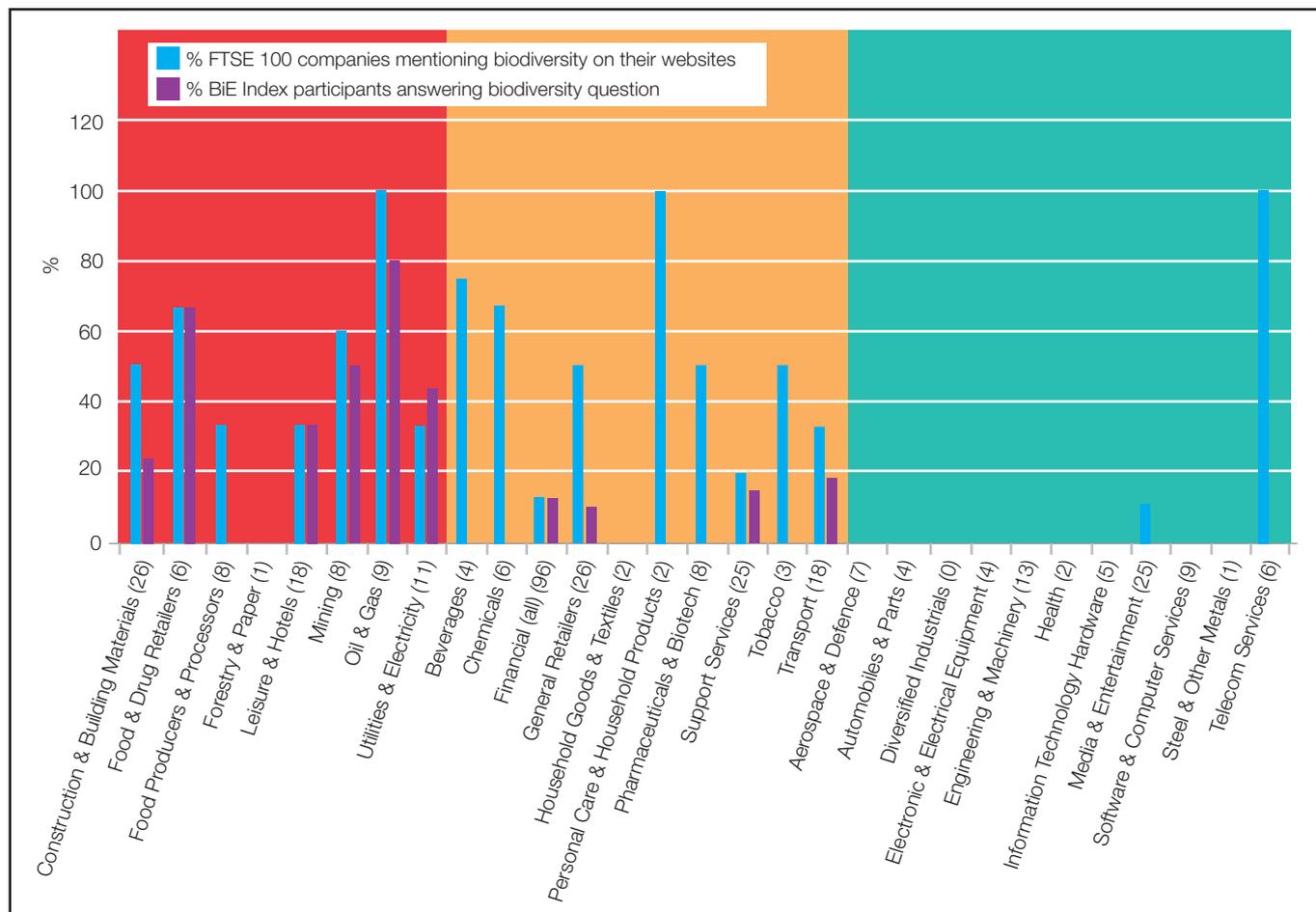
The companies choosing to participate in the biodiversity question of the BiE Index give one indication of in which sectors companies consider biodiversity to be a relevant issue for them. To get another indication, we surveyed the websites of the FTSE 100 companies⁵⁸ for any mention of "biodiversity".

Some companies mention biodiversity in relation to purely philanthropic activities, whereas others give detailed information about how the company is managing its biodiversity impacts and risks. So while 'mentions' cannot be assumed to mean that all of these companies are managing and reporting on biodiversity, we think this gives an interesting indication of the level of awareness of biodiversity amongst companies in each sector. Chart A2 shows the proportion of companies in each sector mentioning biodiversity on their website.

⁵⁷ See for example, Integrating Biodiversity Conservation into Oil & Gas Development [Energy & Biodiversity Initiative (EBI), Washington, 2003] which synthesises much of this work; and Business & Biodiversity: A Handbook for Corporate Action [WBCSD, Geneva, 2002].

⁵⁸ As at 1 April 2004.

Chart A2 The level of participation by each sector in the BiE biodiversity question, compared with the proportion of FTSE 100 companies which mention biodiversity on their websites. Some sectors have been grouped to correspond to the BiE sector groupings.



These results suggest that in a number of sectors, more companies may be aware of biodiversity issues than is suggested by participation in the BiE Index. It should be noted however that the numbers of companies under consideration is not the same for the two indicators. The BiE Index participation is open to FTSE 350 companies, whereas our survey of biodiversity on company websites is restricted to the FTSE 100 companies. Therefore, this chart can only be used to compare trends.

There are two findings which we take from this comparison:

- some companies across a range of sectors have at least some awareness of biodiversity as an issue; further work is needed to ascertain what proportion of the companies are properly identifying and managing these risks
- this is further evidence that companies even in low-risk sectors may have a relationship with biodiversity which need to be investigated to ascertain whether the risks may be material.

Box A1: About the Business in the Environment (BiE) Index

The BiE Index of Corporate Environmental Engagement ranks companies according to their level of management of environmental issues. Participation in the Index is voluntary and open to the FTSE 350 companies*, who respond to a questionnaire from which their scores are calculated. Since 2000, the 'performance' section has included a question about company impact on biodiversity. Companies can choose to complete this question 'if biodiversity is one of your company's most significant impact areas'.

Interestingly, a total of four non-real estate financial sector companies identified biodiversity as a significant impact, completing the biodiversity question. However, two of these companies were listed only in the sister Corporate Responsibility Index, not in the BiE Index, because the majority of the impacts areas they identified were non-environmental, giving insufficient information for a BiE Index rating. These companies were from the life assurance and specialty finance sectors [SIS] respectively. They have not been included in the figures given in chart A2.

It should be noted that, for the BiE Index, companies can complete a maximum of four environmental impact areas, two of which (climate change and waste) are compulsory, meaning that, as in all other aspects of their work, companies do have to prioritise which are their four 'most significant' impacts. This may explain why some companies, which are known to be actively managing biodiversity risks, did not complete this question in the Index.

*The Index is also open to a small number of non-FTSE 350 companies which are either sector leaders in the Dow Jones Sustainability Index, or national members of Business in the Community. For charts 1 and A2, the proportions of eligible companies taking part are calculated as fractions of the FTSE 350 sectors only.

A1.2.3 Industry bodies working on biodiversity risks

Sector	Industry body	Biodiversity work
Construction & Building Materials	CIRIA	Training manual on 'working with wildlife' (http://www.ciria.org/index.html)
Ibid	Quarry Products Association	http://www.qpa.org/env_bio.htm They signed a joint statement of intent with English Nature and the Silica and Moulding Sands Association and formed the Minerals and Nature Conservation forum (http://www.qpa.org/natureconservation/biod.htm) Its members conduct on the ground conservation projects
Mining	ICMM	http://www.icmm.com/sd_biodiversity.php
Oil & Gas	IPEICA	Energy and Biodiversity Initiative http://www.ipieca.org/working_groups/biodiversity/bio_home.html
Food Producers	Crop protection association	Arable Wildlife - Protecting Non Target Species http://www.cropprotection.org.uk/content/resources/5_pub_farmers.asp http://www.cropprotection.org.uk/Content/home/Default.asp
Leisure & Hotels	European Golf association	(http://www.ega-golf.ch/) They have an ecology unit (http://www.golfecology.com/) Course management best practice guidelines - have a section on biodiversity (https://www.bestcourseforgolf.org/content/environment/key_environment/biodiversity)
Utilities (other)	Water UK	http://admin.evolvingmedia.co.uk/users/files/1FinalReport0102.PDF biodiversity Indicators for water industry
Forestry & Paper	Forestry and timber association	http://www.forestryandtimber.org working with grey squirrel initiative
Transport	Environmental Transport Association	http://www.eta.co.uk/main.htm Roads and birds campaign

A1.2.4 Priorities identified by governments and NGOs

Using publicly available information, we have noted the sectors on which a sample of government bodies and international NGOs are focussing. Relevant activities considered were engagement (i.e. working constructively to improve practices), campaigning against companies, or partnering on-the-ground to deliver practical conservation outcomes. The organisations considered are either biodiversity organisations, or organisations with a broader environmental interest which have specific biodiversity-related activities focussed on certain sectors (in which case, only these activities have been considered here)..

English Nature, the UK government agency responsible for protecting and managing biodiversity in England, has identified the industry sectors which have the greatest impacts on biodiversity. In particular, they expect companies in the listed sectors to report on their impacts on sites of special scientific interest (SSSIs). This was the only such priority list that we were able to find for a government body.

The organisations considered, and the sectors with which they are working, are listed in Table A1.

We note that:

- Of the red-zone sectors, food and drug retail is poorly represented, as are utilities
- Although some companies may have been counted twice, as they working with more than one NGO, these are likely to be companies which have identified significant areas for management related to biodiversity and therefore may have particularly significant risks
- some sectors may, because of the nature of their business and impacts, tend to work with NGOs on a more local basis, for example, the utilities and transport sectors.

Chart A3 Number of organisations sampled working with each sector.

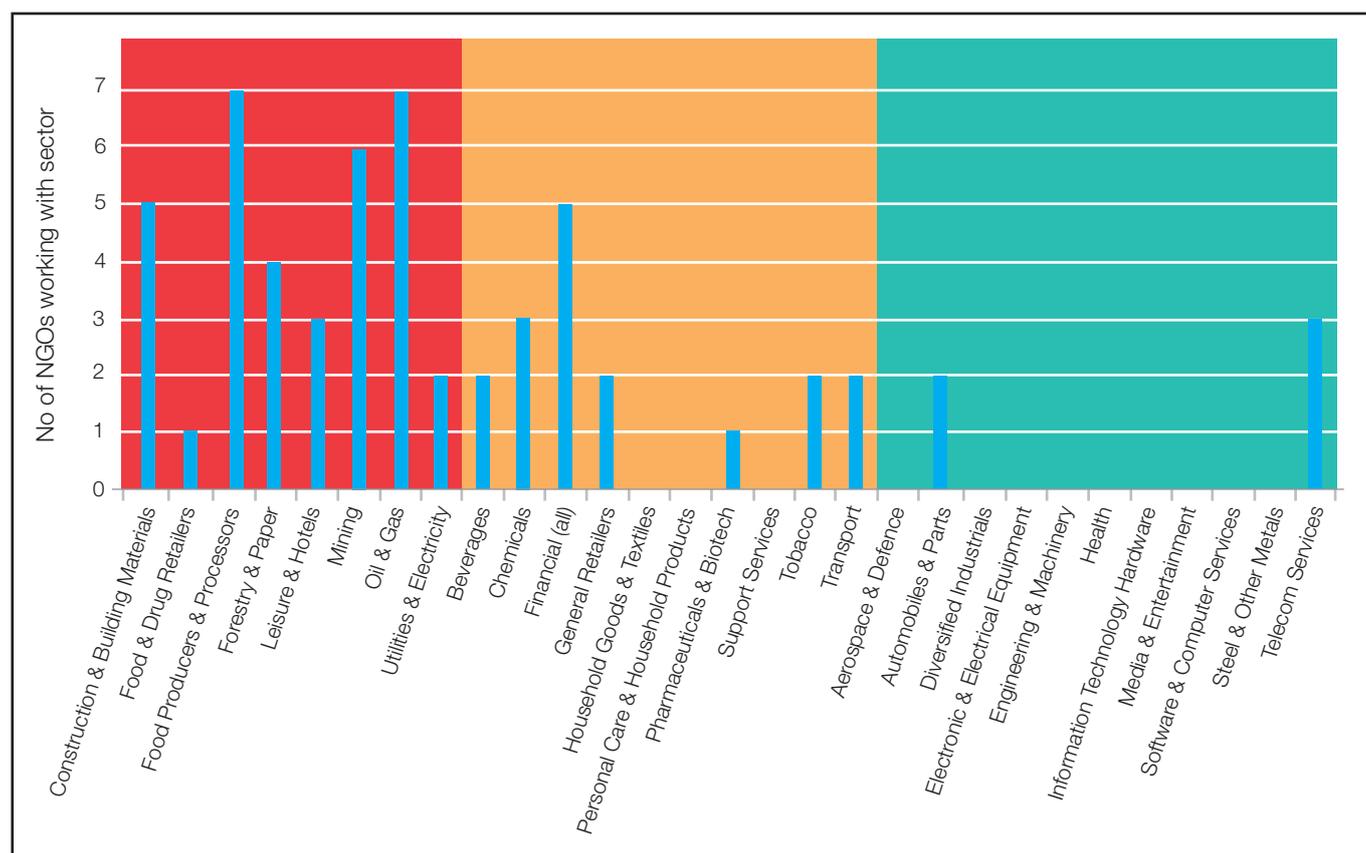


Table A1 Organisations surveyed and sectors with which they are working on biodiversity issues

Sector	English Nature	Earth-watch	WWF	Fauna & Flora Internat'l	IUCN	Conservation Internat'l	Green-peace	Birdlife Internat'l	Friends of the Earth
Food producers and processors	X	X	X			X	X	X	X
Food and drug retailers	X								
Forestry and paper			X			X	X		X
Mining		X		X	X	X		X	X
Oil and gas	X	X		X		X	X	X	X
Utilities (all)	X	X							
Pharmaceuticals		X							
Tobacco		X		X					
Construction and building materials	X	X	X					X	X
Transport	X								X
Chemicals	X	X					X		
Automobiles and parts			X			X			
General retailers		X	X						
Beverages		X	X						
Leisure and hotels	X		X			X			
Diversified industries									
Telecommunication services		X	X	X					
Financial services		X	X	X	X				X

A1.3 Final notes on method by which risk-levels were assigned to sectors

- Pharmaceuticals & Biotech was initially rated within the top high-risk sectors by our experts’ survey. Although there is a strong potential link between biodiversity and this sector, via the role of biodiversity in human health via ecosystem services and potential drugs,⁵⁹ in practice, few major pharmaceuticals companies now rely on material from natural sources. Therefore, we have moved the pharmaceuticals and biotech sector into the amber-zone. We note that this link exists, and suggest that companies in this sector should examine the current and potential future supply chains, as well as possible downstream effects of their products.
- Tobacco was also rated as high-risk by our experts’ survey, due to the heavy reliance on agricultural for the production of the key ingredient, tobacco. However, we have also moved this sector into the amber-zone, because only a few individual tobacco companies will have a heavy direct exposure to agriculture, and because other CSR risks facing companies in this sector present much more pressing risks.

⁵⁹ A framework for action on biodiversity and ecosystem management [UN WEHAB Working Group, August 2002].

- The Leisure & Hotels sector was not initially ranked highly by our experts' survey. However, subsequent research highlighted the presence of this sector on the 'radar screen' of NGOs and governments working on biodiversity, arising from the significant impacts the facilities and resource use for tourism can have on biodiversity. We also believe that there is a strong link between much of the tourism industry and biodiversity which is largely ignored, except by niche 'ecotourism' operators. For this reason, we have moved this sector into our red zone.
- The Financial Services sectors have been grouped for this study, because it is difficult to distinguish clearly between the activities of one sector and another in relation to biodiversity risks. There are some obvious differences related to major business activities, such as project finance for banks, liabilities risks for the insurance sector and similarities with the construction sector for real estate companies. However, all these sectors are involved in major investments activities and so are similarly exposed in relation to the performance of the companies, sectors and projects in which they invest. Overall, we have placed the financial services into the amber-zone.
- Forestry & Paper is a slightly unusual sector amongst the red-zone sectors in our study, in that just one company from this sector is in the FTSE 350 (and none in the FTSE 100), and that therefore little relevant data was explicitly considered by this study. However we have placed it in the red zone for three reasons: first, the activities of companies in this sector so clearly depend and impact upon biodiversity; secondly, this will be relevant to non-UK companies in this sector that are not listed in the FTSE; and thirdly, companies in the Forestry & Paper sector will be in the supply chains of many other companies, and therefore carry a high exposure to their customers' biodiversity or supply chain policies.

Appendix A2. Sources of biodiversity risks to business

Listed below are comments on risk gathered during the research for this report, substantially from our initial experts' workshop.

Access to land

- Access to new sites affected by track record on protecting/restoring biodiversity and water resources.

Reputation

- Biodiversity-related campaign reduces consumer confidence in brand or company resulting in product or brand boycotts and lower sales.
- Local communities question licence to operate leading to disruption and difficulty in recruiting locally.
- Recent graduates may be especially sensitive to company reputation on biodiversity issues.
- Consumer trends and attention given to issues are difficult to predict so risk is hard to evaluate.
- Image of sector as a whole can have a negative impact on the big brands/big companies – even if own practices are good; campaign groups target big well-known companies as part of PR strategy and biodiversity is an emotive issue.
- Aiming for leadership creates a risk in itself of failing to meet aspirations – requires forward management of risks including biodiversity.
- Increasingly rigorous legislative protection for biodiversity in some countries (e.g. UK) – transgressions may impact company reputation as a result of these being reported to stakeholders, if not through impact of sanctions themselves.
- Tourism – issues such as flash-floods resulting from deforestation, or image of degraded natural ecosystems, reduces flow of tourists to region.
- Critical mass effect – potential for biodiversity issues to become a high-profile issue with widespread attention and tip the balance in decisions on sensitive projects.

Access to capital

- Cost of capital increases as loans are refused by some major banks which have adopted the Equator Principles and are not satisfied that the biodiversity risks are being properly managed.
- Even if criteria for good management are met, certain biodiversity 'trade-offs' of a project may make it unfundable especially by government-backed institutions.
- Need to demonstrate good risk management, including of biodiversity issues, to attract private equity.

Access to markets

- Restricted access to markets due to inability to meet specifications from major buyers, such as government departments and agencies, for sustainably-sourced raw materials.
- Changes in inter-governmental relations which impact upon industry can both be driven by biodiversity issues, e.g. fisheries, timber trade, and affect the advantages or risks of setting management standards.

Security of supply

- Loss of biodiversity leads to reduction in quality and availability of essential materials, either directly (e.g. fish) or indirectly (e.g. reduced insect pollination of crop).
- Biodiversity-related campaigns or regulation result in disruption to supply or increased costs of essential materials.
- Reputational issues may force a company to cease procurement entirely from a biodiversity-sensitive area (e.g. timber or palm oil from Indonesia, peat in UK) – even where supply itself is not physically limited.

Relations with regulators

- Delay in acquiring permits to operate resulting from concerns of company track record on biodiversity management, or lack of confidence in quality of biodiversity survey and management plans.
- Regulators may not always prosecute for infringement of laws protecting biodiversity if they know that infringement is an exceptional failure of company management systems and unlikely to be repeated.
- Regulators allow company to negotiate alternative mechanisms to meet regulatory requirements because past experience has built goodwill and trust between company and regulator.

Liabilities

- Impacts of activities on biodiversity leads to financial liability even though the regulatory licences have not been exceeded.
- Cost of project exceeds plan due to unexpected biodiversity impacts requiring mitigating action.
- Liabilities exceed provisions due to unexpected biodiversity impacts or introduction of new regulation.

Ecological Complexity

- Lack of information and understanding about biodiversity impacts leads to unpredictable risks and costs; e.g. discovery of populations of protected species such as great crested newt has halted construction projects in the UK.
- Ecosystem modification can have unexpected and disastrous consequences for an industry e.g. removal of coastal vegetation for shrimp-farming.
- In order to manage these risks, it is necessary to understand the many small components that go to make up a significant risk.
- Complex supply chains lead to poor traceability and hidden or unknown risks- impacts and therefore risks are often hidden e.g. the impacts on sea bed ecology of otherwise healthy salmon farms are poorly known.
- Changing regulatory systems may in future require businesses to take increased responsibility for downstream effects on biodiversity of their products (e.g. endocrine-disrupting hormones in water ecosystems) – precedents set with WEE Directive.

Perception of risk varies with timescale

- Changing priorities of society related to biodiversity can lead to clean-up or remediation costs far higher than predicted at outset of long-term projects e.g. mining.
- Strong relationships with good-standard suppliers may become more important if quality of supply (e.g. of agricultural products) declines as soil biodiversity is lost.
- Future operations can be constrained if protected status is conferred on sites or habitats created as a result of business operations (e.g. quarries in UK).
- Ability of technology to replace biodiversity functions (e.g. nutrient cycling, water purification) is hard to predict and depends on the timescales involved.

Insurance risks

- Changes in legislation, such as the forthcoming EU Liabilities Directive, could have a major effect on the costs associated with biodiversity mismanagement; insurance premiums may then be lower for companies able to demonstrate through understanding and management of biodiversity.
- Maybe parallels to be drawn with climate change-related insurance issues; potential 'catastrophe' scenarios (yet to be drawn out) may leave some businesses or operations uninsurable due to exposure to excessive risk.

Appendix A3. Key conventions, publications and initiatives

Conventions and legislation

Convention on Biological Diversity
<http://www.biodiv.org/default.aspx>

Other international conventions

http://www.businessandbiodiversity.org/int_legislation.html

Earthwatch publications

Earthwatch Publications can be found at <http://www.businessandbiodiversity.org/publications.html>

Business & Biodiversity - The Handbook for Corporate Action. Earthwatch Institute (Europe), World Conservation Union (IUCN), World Business Council for Sustainable Development 2002.

Business & Biodiversity - 2002 A UK business guide for understanding and integrating nature conservation and biodiversity into environmental management systems.

Sectoral organisations, information and publications

Oil and Gas

Integrating Biodiversity Conservation into Oil and Gas development. [Energy and Biodiversity Initiative, Washington 2003]
http://www.celb.org/ImageCache/CELB/content/energy_2dmning/ebi_2epdf/v1/ebi.pdf

International Petroleum industry Environmental Conservation association

<http://www.ipieca.org/>

Energy & Biodiversity Initiative

www.TheEBI.org

Striking a better balance: EIR Final Report [EIR, Washington 2003]

Construction industry

CIRIA

<http://www.ciria.org.uk/>

Mining

International Council on Mining and Metals

<http://www.icmm.com>

Koziell, I. and Omosa, E. 2003. Room to Manoeuvre? Mining, biodiversity and protected areas. London: IIED and WBCSD, 2003.
Breaking New Ground: MMSD Report [Earthscan, 2002]

Extractive Industries Review

www.eireview.org

Miranda, M. et al. 2003. Mining and Critical Ecosystems: Mapping the Risks. World Resources Institute. ISBN 1-56973-554-9.

ISIS. 2004. Are extractive companies compatible with biodiversity? Extractive industries and biodiversity: A survey by ISIS Asset Management plc. February 2004.

ten Kate, K. 2003. Biodiversity: towards best practice for extractive and utility companies By Kerry ten Kate, Director, Investor Responsibility, Insight's presentation to the World Parks Congress, 13 September 2003.

Protecting shareholder and natural value. Biodiversity risk management: towards best practice for extractive and utility companies [Insight Investment, London, 2004]

Water

Water UK

<http://www.water.org.uk/index.php>

Water UK. 2001. Towards Sustainability – Moving Ahead Sustainability Indicators 2001/2002

Food Producers and processors

Crop protection association

<http://www.cropprotection.org.uk/Content/home/Default.asp>

Sustainable Agriculture Initiative

www.saipatform.org

Friends of the Earth palm oil campaign

http://www.foe.co.uk/campaigns/biodiversity/case_studies/palm_oil/index.html

New risks in old supply chains: Where does your palm oil come from? [ISIS Asset Management, London, December 2003 at www.isisam.com/uploadfiles/sripalmoilreport.pdf]

Other publications

Footprints in the Jungle: Natural Resource Industries, Infrastructure, and Biodiversity Conservation by Ian Bowles and Glenn Prickett [Oxford, 2003]

Striking a Better Balance: EIR Final Report [EIR, Washington, 2003]

ACBE. 2000. Value, Growth, Success – how sustainable is your business? A briefing note for directors. Advisory Committee on Business and the Environment.

Driver, A., Cowling, R. and Maze, K. 2003. Planning for Living Landscapes: Perspectives and Lessons from South Africa. Washington, DC and Cape town, South Africa, Center for Applied Biodiversity Science (CABS) and Botanical Society of South Africa. p 9.

Web resources

Global Biodiversity Information Facility
<http://www.gbif.org/>

Corporate Social Responsibility Forum
<http://www.iblf.org/>

International Institute for Environment and Development
<http://www.iied.org/index.html>

World Resources Initiative
<http://www.wri.org/wri/biodiv/biolinks.html>

IUCN
www.iucn.org

World Business Council for Sustainable Development:
www.wbcsd.org

Insight Investment publications on biodiversity
<http://www.insightinvestment.com/responsibility/project/biodiversity.asp>

The Energy and Biodiversity Initiative - comprehensive list of sources of guidance
<http://www.theebi.org/pdfs/sources.pdf>

UK Department of Environment, Food and Rural Affairs <http://www.defra.gov.uk/wildlifecountryside/>

Relevant Contacts

Please note that as from October 2004, ISIS Asset Management will merge with F&C Investment Management; the new company will be known as F&C Asset Management Plc.

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Earthwatch Institute (Europe) is the working name for Conservation Education & Research Trust (CERT), a company limited by guarantee registered in England and Wales (number: 4373313) and a registered charity (number: 1094467).
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