

Biodiversity and Ecosystem Services

Bloom or Bust?

A Document of the UNEP FI Biodiversity & Ecosystem Services Work Stream (BESW)

March 2008



UNEP Finance Initiative
Innovative financing for sustainability

Biodiversity and Ecosystem Services

Bloom or Bust?

A Document of the UNEP FI Biodiversity & Ecosystem Services Work Stream (BESW)

March 2008



UNEP Finance Initiative
Innovative financing for sustainability

Message from the Chair

Recent years have witnessed a significant shift in awareness and willingness amongst the corporate sector to understand and attempt to minimise environmental impact. The corporate attention now being focussed on climate change would have been unthinkable ten years ago, when the private sector would, more often than not, have questioned not only the science behind such claims, but more significantly the overall relevance of such an agenda to the business world.

The same could be said now of the valuation of biodiversity and ecosystem services. Ecological balance is one of the key pillars of sustainable development. On the one hand, the business world affects ecosystems, but on the other it relies on their regulatory services (such as climate, flood control, waste treatment) and provisioning services (such as freshwater, food and fibre). These are services for which no price has historically been paid but, as we are now finding out, do come at a cost.

Human activity in recent decades has impacted these critical ecosystems more quickly and profoundly than ever before and the trends indicate acceleration in that process. Despite these stark findings, the understanding of the true value of these ecosystem services remains in its infancy.

It has been encouraging, however, to see movement on this issue on a number of fronts. Politically, G8 environment ministers together with their counterparts from Brazil, China, India, Mexico, and South Africa recently committed to assess the global economic impact of biodiversity loss. Only when we understand the tangible and material economic benefit of these ecosystem services will the marketplace begin to internalise these impacts in its decision making.

For this reason I welcome the UNEP Finance Initiative Report “Biodiversity & Ecosystem Services: Bloom or Bust?”, which not only sets out to enhance our appreciation of these issues but also translates this into an understanding of the emerging risks and opportunities as well as practical next steps for the finance sector. It is clear that the business world will not be able to function unless we can get these critical ecosystems and the services they provide back into balance.



Richard Burrett

Chair, UNEP FI Biodiversity & Ecosystem Services work stream
ABN AMRO Bank N.V.

Contents

1	The Business Case for Biodiversity	4
	Global Trends	4
	The International Response	7
	Implications for the Financial Sector	7
2	Biodiversity and the Financial Sector – Risks and Exposure	11
	Understanding Risks - Financial Product, Industry Sectors and Location	11
	Risks to Business due to Biodiversity Loss and Ecosystem Service Degradation	14
	Recognising that Opportunities are also Emerging	14
3	Managing Biodiversity Risk and Exposure – Procedures and Tools	17
	Asset Management	17
	Project Finance	17
	Corporate-level Policy Commitments	18
4	Business Opportunities	21
	Opportunities for New Financial Products	21
	Differentiation and Branding	21
	New Investment Opportunities	22
5	Recommendations	27
	Actions for the Financial Sector as a Whole	27
	Actions for Individual Institutions	28
	Actions for Governments and Policy Makers	29
6	Annexe	30
	Sector Overview of Biodiversity Risks	30
	Abbreviations	33
	References	34
	Participating institutions	36
	Acknowledgements	37

1 The Business Case for Biodiversity

8% of global greenhouse gas emissions derive from tropical deforestation. The UK treasury recently estimated the global annual cost of climate change attributable to this and other causal factors to be 5% of GDP. The ability to store carbon is only one service derived from healthy, functioning biodiversity.

Pollination (currently valued at over US\$112 billion annually and in decline), natural coastal defences and abundance and quality of water (valued at an estimated US\$30 billion globally up from US\$1.5 billion currently) can all be linked to biodiversity.

It is no longer a case of conserving charismatic endangered species – although these in themselves can confer significant economic and reputational value. Rather, it is becoming an issue of global policy that the benefits provided by biodiversity are valued and accounted for within traditional business risk frameworks.

The finance sector can play a significant role in incentivising this based on arguments of investment risk and return and business opportunity.

Global Trends

Biodiversity underpins economic development, but it is threatened globally and its ability to continue to provide the goods and services (Box 1) that support economic growth is failing. At a global level, the implications of this have been laid out in a major report – the Millennium Ecosystem Assessment (MA). The MA makes for stark reading (Box 2). It notes that humans have made unprecedented changes to the natural world in recent decades to meet growing demands for food, fresh water, fibre and energy and that this demand will only increase as the global population grows and consumption patterns change (Figure 1).

Box 1 Biodiversity and Ecosystem Services (BES)

Biodiversity includes plants, animals and other organisms and is defined in the Convention on Biological Diversity (CBD) as the variability among organisms from all sources including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; it includes diversity within species, between species and of ecosystems.

Ecosystem services are the goods and services that biodiversity provides. They include soil formation, the provision of food and fibre, air quality and climate regulation, the regulation of water supply and quality and the cultural and aesthetic value of certain plants and species.

For the purposes of this CEO Briefing and the accompanying report, these terms are combined under the acronym BES so as to provide a simple and clear association between these two inter-related aspects of the natural world.

Our understanding of the detailed interactions between biodiversity and ecosystem services are still evolving; however, it is very clear that mankind's impacts on BES is creating material risk for the financial sector, and also a rapidly increasing range of business opportunities to service new and innovative businesses that are seeking to ameliorate or reduce impacts to BES, or service new markets for products and services that promote better and more sustainable management of BES.

Mankind's use of biodiversity and ecosystem services (BES) has contributed to human well being and economic development, however, continuing this use at the current or – as predicted – greater levels is not sustainable. The rate and scale of biodiversity degradation is significantly weakening the ability of the natural world to deliver key services such as climate regulation, air and water purification, provision of medicines and protection from natural disasters. The key drivers of this degradation are:

- Habitat destruction by conversion for urban and industrial development, and agriculture;
- Pollution, particularly of water, but also through air emissions and solid waste;
- Climate change, which is affecting the distribution and status of biodiversity globally, and also the ability of ecosystems to regulate the climate;
- The introduction of non-native invasive species; and
- Over-exploitation (for example of fisheries, timber, and certain birds and mammals).

Box 2 **Global Trends and Implications of Biodiversity and Ecosystem Service Loss - Key Messages**

Ecosystem services are declining in most instances:

- Two thirds of ecosystems examined in the MA are being degraded or used unsustainably;
- Cultivated land now covers one quarter of the world's land - this has resulted in massive loss of natural habitats such as forests and wetlands and many of their associated ecosystem services;
- Demand for food is projected to increase 70-80% by 2055, and a further 10-20% of grassland and forest is projected to be converted to agriculture between 2000 and 2050. This will result in significant additional release of green house gases (GHG);
- Natural habitats and species are declining by between 0.5 and 1.5% per year; 12% birds, 25% mammals and 32% amphibians are threatened with extinction in the next century, largely as a result of our activities;
- Coastal habitats are being destroyed at an unprecedented rate – 20% of the world's coral reefs has been destroyed and a further 20% is significantly degraded resulting in the decline in availability of fish and coastal defences;
- More than a third of global mangrove forest was lost between 1990 and 2000; this, together with the loss of other coastal defences has reduced our protection against natural hazards such as hurricanes and tsunamis;
- Bees are in decline globally, linked to escalating levels of pollution and loss of habitat. Overall, 35% of the global food production from plants benefits from animal pollination. The value of all this ranges from \$112 billion to \$200 billion annually.

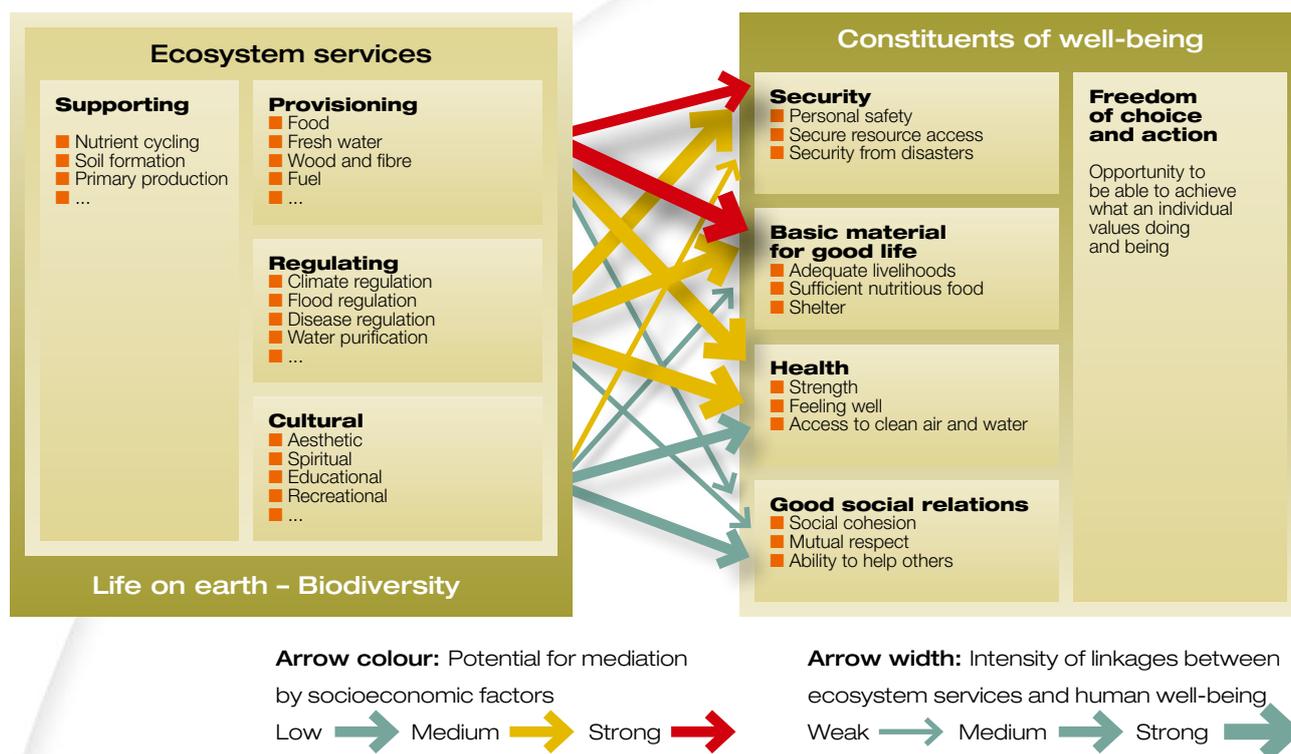
Unless otherwise indicated, figures and information are drawn from the Millennium Ecosystem Assessment

While the full implications of losses to BES are not yet known (in much the same way as the impacts of greenhouse gas (GHG) emissions were hard to quantify and understand 10 years ago), there is strong evidence that the costs are growing - and growing quickly. For example:

- Mankind has already cleared half the world's natural habitats. A single year's habitat conversion costs society US\$250 billion each and every year into the future;
- Depending on the region, 5-20% of freshwater use exceeds long-term sustainable supply and 15-35% of irrigation is unsustainable. Scarcity of water will lead to competition for supply and increasing operational costs for water-dependent industries;
- Inaction on climate change (which could be partially mitigated by better management of forests and other habitats) will reduce global GDP by 20% annually.

Figure 1

Biodiversity and Ecosystem Services (BES)



Importantly, BES impacts do not occur in isolation. They are closely linked to other environmental and social concerns that the financial sector is beginning to address.

- Climate change and biodiversity are closely interlinked:** Forests and other natural ecosystems such as peat lands have a key role in locking up GHG emissions (the recent Stern report attributed 20% of annual human generated GHG emissions specifically to deforestation). Current valuation methods do not generally take into account the economic costs linked to the release of carbon from ecosystems;
- The impacts of natural disasters are compounded by loss of ecosystems:** Loss of natural coastal defences (such as mangroves, salt-marshes and coral reefs) increases vulnerability to sea level rise and storms. The total economic impact of Hurricane Katrina (estimated at US\$150 billion), for example, might have been significantly reduced if coastal wetlands in the region had been preserved;
- Water supply and sanitation services are underpinned by intact ecosystems:** The role that the Pantanal wetland system in Brazil plays in water purification and supply is estimated to have an economic value of some US\$ 6.3 billion per year;
- Social impacts are often associated with BES loss:** The role of BES in providing food and water, building materials, medicines and other goods and services to rural communities is extremely significant (especially in emerging markets), and transactions that increase the vulnerability of rural communities because of ecosystem service damage (for example damage to water quality and supply, air and soil quality) may also create compliance challenges with national laws and the social policies of financial institutions.

These linkages are only now becoming evident and there is recognition that a broader and more comprehensive understanding of the way in which BES underpins economic development is required.

The International Response

The importance of these goods and services is increasingly recognised in international and national conventions and there is wide endorsement of the global commitment to achieve a significant reduction of the current rate of biodiversity loss as a contribution to poverty alleviation and to the benefit of all life on earth by 2010:

- The Convention on Biological Diversity (CBD) is increasingly focusing on the role of business as a source of biodiversity impact and as an enabler of better BES management, and there is a major opportunity for financial institutions to play a constructive role in this process.

Decision VIII/17 of the CBD CoP 8 held in March 2006 at Curitiba, Brazil specifically states that parties: “Invites businesses and relevant organisations and partnerships, such as the Finance Initiative of the United Nations Environment Programme, to develop and promote the business case for biodiversity...”

- At the G8 environment meeting in Potsdam in March 2007, the environment ministers of the G8 countries together with environment ministers from five newly industrialising countries (Brazil, China, India, Mexico and South Africa) agreed on a “Potsdam initiative” to estimate the economic costs of global biodiversity loss. There was a clear message to the financial sector too:

“We will approach the financial sector to effectively integrate biodiversity into its decision making... and we will enhance financing from existing financing instruments and explore the need and the options of additional innovative mechanisms to finance the protection and sustainable use of biological diversity, together with the fight against poverty. In this context we will examine the concept and the viability of payments for ecosystem services.”

A key element of the initiative is the proposal for a ‘Stern type’ review of the economic significance of global biodiversity loss. Whilst it is premature to pre-judge the findings of this work, it seems likely that political action (including laws and regulations that specifically restrict or control damage to ecosystem services) is a possibility.

Implications for the Financial Sector

The role that the financial sector plays in enabling BES loss and damage is increasingly recognised, and there is clear evidence that failure to manage BES risks has direct and tangible impacts on financial performance, reputational risks and long-term depositor commitments. As such, three broad areas of risk are emerging (Figure 3):

In the short-term:

- **Increased reputational risks:** To institutions involved in controversial lending or investing. The reputational risks in this situation are generally at the corporate level and not transaction level;
- **Liabilities:** That may become apparent as national laws, banking regulations and reporting requirements become more demanding and increasingly seek to incorporate non financial issues.

In the longer term:

- **Lower and less secure investment returns:** Loss of revenue as a result of clients failing to achieve repayments or business growth targets as a consequence of failing ecosystem services and loss of biodiversity.

Figure 2

An Overview of the Causes and Impacts of Biodiversity and Ecosystem Service Loss

Drivers of BES Change	Impacts on BES	Impact To Business
Habitat Loss and Conversion	<p>Conversion of natural habitats such as forests to croplands, urban and industrial lands</p> <p>Extinction and damage to plant and animal species – resulting in reduced populations and distribution of biodiversity in many instances;</p> <p>Direct and indirect impacts to water, soil, and air quality.</p>	<p>Loss of raw materials (e.g. timber, pharmaceuticals, and food);</p> <p>GHG emissions and accelerated climate change and attendant knock-on effects to business;</p> <p>Increasing public concern of the losses of key habitats (e.g. rainforests and wetlands) with increasingly strong stakeholder reaction to companies that are seen as responsible for these losses.</p>
Pollution	<p>Reduction in species' numbers and variety (particularly in freshwater and marine environments) as a result of the application of agrochemicals, emissions and wastes from industrial processes, and urban development;</p> <p>Large scale changes in the quality and functioning of some ecosystem services (particularly climate control – see below).</p>	<p>Increased costs associated with securing adequate supply and quality of water, particularly potable supplies;</p> <p>Further loss of raw materials through damage to species and their habitats (e.g. forest assets from acid rain).</p>
Climate Change	<p>Changes in the distribution and populations of plant and animal species as a result of deforestation and other land use changes and induced effects) and the use of fossil fuels to meet the world's growing energy needs;</p> <p>Increased instability in the functioning of some ecosystem services (for example freshwater supply, the reduced ability of oceans to retain CO₂ as they warm, and climate and weather patterns) as a result of complex interactions across a range of ecosystem services.</p>	<p>Negative impact on economic development. Reduced and changed productivity of current farmlands (leading to increased habitat conversion); sea level rise, increasing drought and water scarcity, spread of pests and diseases such as malaria;</p> <p>Increased pressure on remaining wild living resources such as forests and fish stocks;</p> <p>Increased conflict and human migration as a result of displacement of people by extreme weather events and competition over resources.</p>
Invasive Species	<p>Reduction in some plants and animals as a result of increased competition through the spread of species outside of their normal range;</p> <p>Increase in the distribution of invasive species;</p> <p>Impacts to ecosystem services and functioning where invasive species are widespread or have occurred on a large scale.</p>	<p>Disruption of ecosystems, resulting in economic loss, environmental damage and impacts specifically to agribusiness, tourism, forestry and industries reliant on water supply, (the estimated damage and control cost of invasive species in the U.S. alone amount to more than US\$138 billion annually).</p>
Over-harvesting	<p>Reduction (and potentially local or global extinction) of some species of trees, fish, birds and mammals.</p>	<p>Reduced access to raw materials for companies reliant on renewable natural resources;</p> <p>Loss in market share and decreased profit margin for businesses reliant on the harvesting of renewable natural resources.</p>

Figure 3

Drivers for Change – The Business Case

Risks	Drivers in action
<p>Reputation and Brand</p>	<ul style="list-style-type: none"> ■ Society at large is focusing on the causes of, and responsibilities for BES loss. The financial sector is seen as a key point of leverage in enabling BES loss (and also as a mechanism for effecting better BES assessment and management). Recent damaging reputational campaigns have drawn attention to: <ul style="list-style-type: none"> – Forestry: Financial Institutions providing advisory services to the IPO of the Samling Group on the Hong Kong Stock Exchange; – Oil and Gas: Proposed investment in the Sakhalin II project and impacts on the critically endangered western grey whale; – Agribusiness: Investment in agribusiness in Brazil that contributes to deforestation; – Mining: Financial institutions being targeted for the ecosystem and related social impacts of “mountain top removal” mining in the USA. – Opportunities to build and define aspects of a financial institution’s brand based on biodiversity conservation.
<p>Liabilities and Compliance Aspects</p>	<ul style="list-style-type: none"> ■ The decline in BES is likely to result in increased regulation as governments and the international community factor the management of ecosystem services into private sector activities. For example the EU Liability Directive specifically covers environmental damage and compensation requirements where species and natural habitats are damaged; ■ The impacts of Basel II and the Potsdam Initiative also seem likely to increase the attention of the financial sector on “non-financial” risk, as the materiality of BES liabilities becomes more explicit.
<p>Investment Returns</p>	<ul style="list-style-type: none"> ■ Loss of investment returns arising from (i) disruption to business operations caused by natural hazards (ii) reduced (agricultural) yields and insecurity of raw materials, (iii) increased insurance premiums, (iv) costs imposed by governments in efforts to curb GHG emissions, (v) declining collateral value of land, and (vi) declining share price or company valuation as a result of disruption in supply of goods and services dependent on BES; ■ Opportunities around the generation of carbon credits from forest conservation as shown by the recent launch of the US\$200 million carbon backed forest financing facility by Credit Suisse; ■ For sponsors and clients operating in some sectors (including oil, gas and mining, and agribusiness), access to existing and new assets is increasingly influenced by demonstration that companies can manage BES impacts; ■ Opportunities for ethically differentiated products such as socially responsible investment funds.

In parallel, the role that the finance sector can play in supporting sustainable BES management is also becoming apparent. Efforts to date have focused on asset managers, although since 2004 there has been a significant shift in focus to deepen collective understanding of how the world’s largest institutional investors – pension funds, special government reserves – integrate ESG considerations into their short- and long-term investment policies and investment decision-making. Also, evidence from the marketplace indicates the mandates put out by these large institutional investors are increasingly integrating ESG considerations, such as BES. It is noteworthy that:

- BES (and other environmental and social issues) is moving mainstream. A number of FIs have released major reviews that reference the materiality of BES risks across a range of investments

and industry sectors. The emergence of the UN Principles for Responsible Investment (UN PRI) managing total assets in excess of \$10 trillion and a clear commitment to consider environmental issues in the selection of investment opportunities will further strengthen and embed BES (and other environmental issues) into mainstream investment decision making;

- Shareholder activism around BES is becoming evident, for example, in May 2006, over a quarter of ConocoPhillips' shareholders voted for a resolution put forward by U.S. Public Interest Research Groups (PIRG), asking the company to consider a policy of refraining from drilling in and around an area of high biodiversity importance in the Arctic. No national wilderness protection shareholder resolution has ever received a higher vote;
- The Dow Jones Sustainability Index and BOVESPA (the Brazilian Stock Exchange) both cite biodiversity as a material issue.

This report provides a primer for institutions that wish to manage BES risks more effectively and also to understand how opportunities for financial products and services that support sustainable BES use can be developed.

JPMorgan Chase

believes that there are certain places on earth with cultural and natural values so great that we as a global citizen must take extra precautions to protect them. JPMorgan Chase prefers to only finance preservation and light, non-extractive use of forest resources for projects in forests whose high conservation values are endangered. In addition, we will not finance extractive projects or commercial logging in World Heritage sites



2 Biodiversity and the Financial Sector – Risks and Exposure

Understanding Risks: Financial Product, Industry Sectors and Location

Although there are opportunities for FIs to enhance the BES management of their physical assets and direct operations (Box 3), it is clear that the main BES risks relate to lending and investment activities, and that these vary depending on the financial service being offered, the sector in which the transaction is proposed and the location of proposed activities.

Box 3 Direct Impacts to Biodiversity and Ecosystem Services from Physical Assets and Operations

The physical assets (buildings, storage, etc.) and operations of a bank (particularly purchasing and procurement commitments) can have impacts on BES, especially when considered in total. For example a corporate commitment to procure furniture and paper products from certified sustainable sources can have significant impacts when rolled out across the breadth of an institution's operations. Many institutions have made commitments to address BES issues (particularly relating to forests and forest products and water use) and it is clear that there are particular benefits in terms of the support and interest this can generate internally with staff.

In a related manner, some institutions have made commitments to active management of BES issues in the development of their assets as is evidenced by the Royal Bank of Scotland's (RBS) efforts at its new global head quarters at Gogarburn in Edinburgh. This property is situated on a brownfield location within Edinburgh's greenbelt and has an ecologically sensitive watercourse running through the site.

RBS took proactive steps beginning in the design phase and now evident in occupation to protect and enhance biodiversity on the site and surrounding areas. A Biodiversity Action Plan (BAP) was developed as a framework to identify important habitats and biodiversity (including species protected in the UK), control invasive species, monitor the biodiversity on site and encourage indigenous species to flourish. Bat and bird boxes have been erected across the site and an otter holt has been constructed to encourage the species to recolonise areas where it had been absent as a result of previous disturbance. Felled or storm damaged trees are left to rot down on site to create habitats for birds, mammals and insects. Sustainable Urban Drainage Systems (SUDS) have been installed to intercept runoff from the site and car parks, these then 'clean' the water before it runs into the watercourse. The campus conducts regular bird and biodiversity monitoring and the regular water tests have showed that through the Bank's actions, the SUDS system has improved downstream water quality.

Financial Product: Different financial products and services create varying exposure to risk since attribution (i.e. the extent an FI can be held accountable for the BES impacts of a transaction) and leverage (i.e. how much can an FI influence client behaviour) fundamentally affect the ability of an FI to engage with its clients (Figure 4).

Industry Sector: Certain industry sectors have a greater impact on BES which can create additional (reputational) risks to FIs that invest or lend to companies perceived to create undue BES impacts (e.g. the extractive sector, agriculture and forestry). Figure 5 provides an overview by industry sector which serves as a high-level indicator of key risks that may be apparent in specific transactions (further details are included in Annexe 1).

Figure 4 Attribution of Financing and Investment Risks to Selected Financial Services

Products/ Services	Characteristics	Risk Attribution	Leverage Potential
Project Finance	<ul style="list-style-type: none"> Site-specific and known use of funds; Often considerable information available from environmental and social impact assessments. 	<p>High</p> <ul style="list-style-type: none"> Clear causal relationship between project financing and biodiversity impacts and ecosystem services risks (such as water scarcity); Clear materiality links between financing impacts. 	<p>Good</p> <ul style="list-style-type: none"> Duration of loan often long; Leverage can be effected through financing terms, disbursement schedules and the integration of BES into covenants, disbursement conditions and project completion tests.
Corporate Loans	<ul style="list-style-type: none"> Use of proceeds may be unknown; Requires greater understanding of general BES risks related to the sector, and client commitment, capacity and track record to manage BES risks; Supply chain risks may require particular attention. 	<p>Variable but can be high</p> <ul style="list-style-type: none"> Level of attribution depends on whether use of proceeds is known. 	<p>Variable</p> <ul style="list-style-type: none"> Limited direct leverage if use of proceeds is unknown. Potentially more significant leverage where use of proceeds is known; Reliance on client environmental and social management systems is often important.
Investment Banking	<ul style="list-style-type: none"> Use of proceeds may be for non-specific corporate development activities; Disclosure of environmental and social risks required, to varying extent, by stock exchanges and regulators. 	<p>Limited but growing</p> <ul style="list-style-type: none"> Attribution of an institution's role in financing/ enabling potentially BES-damaging activities difficult, but this does not prevent civil society groups from targeting institutions that they perceive as supporting companies that have questionable BES records. 	<p>Variable but often good</p> <ul style="list-style-type: none"> Good leverage especially if relationship with client is long-term; Risk of client migration to institutions with less demanding environmental requirements; Short turn around times for transactions may make it difficult to establish a good understanding of BES risk where information is incomplete.
Fund Management	<ul style="list-style-type: none"> Portfolio selection, engagement and proxy voting are increasingly important; Proxy voting outcome is publicly available in many jurisdictions and hence there is greater transparency at least for publicly traded companies. 	<p>Limited but growing</p> <ul style="list-style-type: none"> Attribution of fund managers accountabilities to BES have traditionally been weak; Principles for Responsible Investment (PRI) appear likely to drive change significantly. 	<p>Variable but can be good</p> <ul style="list-style-type: none"> Leverage influenced by volume of shares held and capacity/ appetite of fund managers to engage; PRI (and SRI tools and experiences) provide a platform for scale up of engagement; Large size and long-term horizon for pensions investments means they wield considerable influence and have inherent interest in long term performance of companies (i.e. recognising that effective BES management is material to company valuation).
Trade Finance	<ul style="list-style-type: none"> Limited recourse facilities to finance trade in oil, precious and base metals and soft commodities; Commodities used as collateral to fund working capital requirements; Commodity finance commonly used in emerging economies where BES issues are particularly apparent. 	<p>High</p> <ul style="list-style-type: none"> Lending related to specific commodities which incur BES impacts in their lifecycle (e.g. biofuels, cotton, base metals); Growing evidence of biodiversity impacts associated with agribusiness (particularly biofuels) and associated with damage to ecosystem services (particularly water). 	<p>Low but opportunities do exist</p> <ul style="list-style-type: none"> Tenor and duration of transactions may preclude leverage (short term, uncertain provenance and limited attribution to specific impacts); Increasing demands for information on product sourcing (driven by food safety, environmental and social and other needs) means that chain of custody and related certification systems are increasingly being applied to commodities and attribution/ leverage.

Figure 5 Risks to Biodiversity and Ecosystem Services from Specific Industry Sectors

Industry Sectors	Impacts to BES				
	Habitat Loss and	Pollution	Climate Change	Invasive Species	Over-harvesting
X indicates major biodiversity risk x represents biodiversity risk					
Agriculture	X	X	X	x	
Biofuels	X	x	X	x	
Food and Beverages (including supply chains)	X	X	X		x
Construction and Building Materials	x	x	X		x
Waste Management		x	x		
Forestry and Paper	X	x	X		x
Leisure and Tourism	X	x	x	x	
Oil and Gas	X	X	X	X	
Mining	X	X	X		
Electricity Generation and Supply	X	X	X		

“ANZ has indicated that it will develop a range of sector policies and that a Forests and Biodiversity Policy will be the first of these. It will act as a reference point for future ANZ decision-making on any transaction that has the potential to significantly impact intact forests and/or biodiversity values.”

Location: The location of a transaction (and its impacts through supply chains) is also important to understanding the materiality of BES risks. There are four underpinning factors:

- The BES values of the area in question (i.e. areas with naturally high levels of biodiversity such as some tropical rainforests, coral reefs and wetlands);
- The capacity and effectiveness of government to control and manage risks to BES (often, there is less capacity in emerging and developing economies);
- The social context in which the investment will take place, and particularly local communities’ reliance on ecosystem services (e.g. for food, building materials, medicines and cultural values);
- Cumulative and indirect impacts (e.g. increased hunting and deforestation in remote areas as a consequence of roads and infrastructure construction).

The BES complexities surrounding the current interest in biofuels as an area for investment is testament to these complexities (Box 4).

Box 4

Biofuels, Climate Change and Biodiversity - Perverse Incentives and Incentive Risk in the Palm Oil Sector

The recent growth of interest in the investment opportunities offered by biofuels as a response to climate change and fuel security is experiencing a range of unintended consequences. These include:

- Accelerating forest and other habitat loss in Indonesia and Brazil as a direct consequence of biofuel demand. An estimated 98% of Indonesia’s rainforests is predicted to be lost by 2022 as a result of illegal logging and palm oil development;
- Threats to species such as the orangutan from biofuel expansion. Since 1900, the number of Sumatran orangutans is thought to have fallen by about 91%, with rapidly accelerating loss towards the end of the twentieth century;
- Increasing scepticism over the net carbon benefits of biofuels. Expansion of palm oil plantations on low lying peat lands in Indonesia is allowing huge releases of carbon (estimated 1.4 billion tons per annum) that was previously stored in soils/peat into the atmosphere.

Efforts to map areas of biodiversity risk based on these (or similar) factors have proved only partly successful, since the interplay of these factors and the over-arching issues relating to sector and financial leverage mean that it is difficult to be prescriptive about the type and materiality of risks specific to a transaction. Nevertheless, maps and overlays can serve as higher level risk management screens (where they are useful in identifying protected areas and extensive areas of natural habitats such as forest or grasslands). The World Atlas of Biodiversity developed by UNEP World Conservation Monitoring Centre and NGO-specific schemes such as Conservation International's hotspots and BirdLife International's Important Bird Areas can provide "landscape" guidance on potential biodiversity risk; however, it is often the case that more detailed and transaction specific due diligence is also required, and it should also be recognised that important biodiversity may be located outside of protected areas, and thus an awareness of potential impacts to BES in the broader "unprotected" landscape is also necessary.

Risks to Business Due to Biodiversity Loss and Ecosystem Service Degradation

Some industry sectors are particularly exposed to risk linked to declining BES, primarily those that rely directly on the availability of natural products (e.g. fisheries and forestry), healthy function ecosystems (e.g. agriculture, biofuels, food and beverages), or services derived from them (e.g. water utilities, hydropower, tourism). The risks associated with declining BES have affected businesses and financial returns in all these sectors. In the past, businesses and financial institutions have offset risks by spreading activities to new areas or locations; however, the pace of globalisation and scale of economic activity now means that new and unexploited resources and goods are becoming scarcer and less easy to secure – requiring greater awareness of BES risks in business and financial planning and assumptions. These risks are, of course, also driving innovation and efficiency in many businesses (e.g. aquaculture to offset losses of fish and shellfish, and energy and water efficiency in industry and agriculture).

F&C Asset Management (F&C) has identified a number of overarching business risks associated with failure to assess and manage a company's impacts on BES (Box 5, opposite).

Given this backdrop, and the significant economic and financial implications, it is surprising that BES issues have not been more successfully addressed by FIs since they increasingly represent material investment risks. There are a number of reasons for this, many of which can be linked to classic market failure (Figure 6).

Recognising that Opportunities are Also Emerging

While risk management is currently the focus of attention, opportunities to capitalise on BES are also evident, and a number of FIs are now beginning to service new (and mainstream) markets that are responding to these trends. Reforestation and afforestation programmes are already part of carbon markets and there is an increasingly strong NGO and governmental lobby to include forest conservation (so called avoided deforestation – where payments would be made to retain forest cover) as part of post-2012 Kyoto mechanisms. In addition, newly emerging opportunities in water supply and management and markets for ecosystem products and services derived from biodiversity seem set to grow significantly (Section 4).

Box 5 Business risks arising from failure to assess and manage BES issues

- **Access to Land:** Development permits and community consents to operate may be affected by a company's track record in managing BES issues. Permits and operational delays relating to BES concerns have already proved costly to a range of companies and this trend is set to increase (e.g. the share price of Associated British Ports dropped by 12% in the week that the UK government refused planning permission for a new port which would have affected protected areas, requiring the company to write off £44.9 million for the project in 2004. Pre-tax profits dropped by 69% and earnings per share by 74%);
- **Access to Capital:** As the financial sector becomes more aware of the risks posed by poor BES management F&C noted that this would reduce the ability of companies to access finance;
- **Reputation:** Where a company brand is linked with environmental responsibility, exposure for poor biodiversity performance may be particularly damaging;
- **Access to Markets:** May be restricted through a failure to meet demands for sustainably sourced products set by major customers. As concerns grow over global impacts to BES, consumers, retailers and wholesalers of a range of products and commodities are increasingly looking down the value chain to understand whether there are BES issues that require attention. The risk of market exclusion is very real and growing across a range of industry sectors (e.g. the commitments that a range of major food retailers are now making towards the purchasing of sustainably sourced goods, and the clear message that suppliers that cannot deliver this will be excluded from their value chains);
- **Security of Supply:** As ecosystem services decline, raw materials such as water, timber and food products, which businesses depend on, become costlier, more complex, and less easy to secure in the long-term. For example, price rises due to restricted supply have continued to put pressure on sales for Unilever's cod products. Increasing cod prices have reduced related product margins by 30%;
- **Liabilities and Laws:** Regulatory regimes are imposing increasing penalties on damage to BES. The EU liabilities directive in particular will hold polluters responsible for damage to species and habitats. "Wetland" banking requirements that are evident in the USA (Figure 8) demonstrate the influence of regulations and laws.

Figure 6 **Challenges in Understanding BES Risk**

Cause	Implication
<p>Uncertainty over Cause and Effect</p>	<ul style="list-style-type: none"> ■ Time delays between financing/development and impacts on BES create complex interactions between cause and effect that make attribution difficult; ■ Indirect effects of an activity (e.g. via supply chains) further remove it from the capacity of sponsors/clients to manage and understand as part of their business.
<p>Uncertainty over Responsibility and Materiality of Risks</p>	<ul style="list-style-type: none"> ■ Responsibilities for BES issues are often uncertain for financiers – “this is the responsibility of our clients not ourselves”; ■ Lack of robust data on the economic and financial value of BES; ■ Biodiversity is perceived to be about conserving animals and nature, and the fundamental links between biodiversity, ecosystem services that are derived from it, human well being and economic development have not been fully recognised.
<p>Lack of Leverage and Influence</p>	<ul style="list-style-type: none"> ■ The short-term nature of some financial transactions preclude adequate due diligence and reduce leverage over the practices of investment/loan recipients.
<p>Broad Boundaries, Complex Externalities and Free RIDERS</p>	<ul style="list-style-type: none"> ■ BES is perceived as a public good and the costs of BES loss are born by the society at large while the benefits of short-term gains are captured by individuals (or individual companies), so there is limited incentive to improve practice at the company level; ■ Roles and responsibilities for the management of public goods where ownership is unclear mean that free riders benefit.
<p>Limited capacity, Skills and Tools</p>	<ul style="list-style-type: none"> ■ There is limited internal capacity or understanding of BES in many FIs; ■ Complex language and inconsistency in its use by those working to conserve BES; ■ The lack of rapidly accessible and easily intelligible data on key areas of BES value and difficulty and costs involved in describing and quantifying impacts; ■ The lack of robust tools and consistency in application of tools means that precedents and “case law” are slow to emerge.

3 Managing Biodiversity Risk and Exposure - Procedures and Tools

The financing landscape will increasingly reflect the materiality of BES risk, and some FIs have begun to factor this into their risk assessment and management. A range of tools and procedures are emerging that manage BES issues more consistently both at the level of individual FIs and also via collective action. These tools have focused on asset management and project finance to date, but also include industry level initiatives such as the UNEP FI Biodiversity and Ecosystem Services work stream (BESW).

Asset Management

The asset management sector has made significant progress through work conducted by F&C and Insight Investment at an industry portfolio level (Box 6). This work has been given a strong platform through the UN PRI whose signatory members manage in excess of \$10 trillion and have committed to the integration of environmental (including BES), social and governance issues in their investment decisions and ownership practices. The PRI, launched by former UN Secretary General Kofi Annan in April 2006 and endorsed by current UN Secretary General Ban Ki-Moon in July 2007, was a process catalysed originally by UNEP FI Asset Management Working Group (AMWG) materiality research. The PRI process was subsequently managed for the UN Secretary General by UNEP FI and the UN Global Compact.

Box 6 Asset Management and Biodiversity

Asset managers Insight Investment and F&C have both developed tools to evaluate biodiversity risk within their portfolios. The approach combines research into key issues with a structured analysis of investment portfolios and engagement with investee companies.

F&C continues to engage with its investment companies on the issue of BES based on an analysis of the potential BES materiality to different industry sectors, using this analysis to encourage improvement amongst the companies benchmarked.

Insight Investment initially focused on the mining, oil and gas, and utilities industries. Through a process of stakeholder consultation, Insight defined a benchmarking framework which allowed analysis of companies within their sector and their approaches to understanding and managing BES risk. Work is now underway within the UNEP FI's BES work stream (through the 'Natural Value Initiative' led by Fauna & Flora International and UNEP FI) to adapt this tool for application to the food and beverage industry.

Project Finance

The project finance community has been addressing BES at a project/asset level through the implementation of the Equator Principles (EP) which require sponsors to "protect and conserve biodiversity and promote the sustainable management and use of natural resources through the adoption of practices that integrate conservation needs and development priorities" since 2003.

The EPs provide a voluntary framework for addressing BES in project financing and advisory services and require project sponsors to assess a project's impacts on biodiversity (including specifically, impacts to ecosystem services and natural habitats, the introduction of invasive alien species, sustainable use, and social impacts).

The clear link between project financing and BES impacts has created particular risks and has resulted in financial institutions taking a proactive role in the use of leverage and conditions with sponsors to manage reputational as well as investment risks.

Corporate Level Policy Commitments

Goldman Sachs recognises that diverse, healthy natural resources are a critical component of social and sustainable economic development... To that end, we will work to ensure that our people, capital and ideas are used to help find effective market based solutions to address climate change, ecosystem component of social and critical environmental issues

At the level of individual financial institutions, an important initial step is often the evolution of a clear policy of recognition and intent in relation to BES (see side bar). Many of the current policies focus on specific industry sectors that have high biodiversity impacts (e.g. extractive sectors, forestry and hydro power), often go beyond complying with host country regulations, and increasingly cite global best practice requirements. Common elements of these policies include:

- Specific commitments to comply with the law in terms of BES impacts (especially for forest products and forestry transactions) as the basis for even considering a transaction;
- Avoidance of areas containing important biodiversity such as World Heritage Sites or other protected areas;
- Recognition of the rights of indigenous communities and others who rely directly on BES for their livelihoods.

When an institution's commitments to BES have been articulated, an important next step is to develop procedures to ensure that the issue is raised in a timely manner, and clearly and consistently assessed as part of credit review processes.

To assist in this task, FIs have developed checklists which are used to identify and screen for BES risks (among other environmental and social risks). Some companies are beginning to incorporate BES issues in Environmental and Social Impact Assessments or Environmental Audits - and this trend should be strongly supported where BES issues are evident in a transaction. Where specific issues or risks are identified, some FIs have required Biodiversity Action Plans (BAP), which identify the expected impacts of the development to BES and sets out a prioritised framework for action by the client. A summary of tools and techniques that have proven useful in assessing and managing BES risks is provided in Box 7.



Box 7 Biodiversity and Ecosystem Service Assessment and Management Tools

Tools for Risk Assessment

Checklists: Sector specific checklists can be used to screen project or transaction BES risks. They are particularly useful during the initial stages of due diligence to ascertain whether a transaction deserves more in-depth BES assessment based on project (location, sector, scale) and client (capacity, commitment and track record);

Environmental and Social Impact Assessment (ESIA): For project finance and other transactions where use of proceeds is known, project sponsors may be required to prepare an ESIA as part of permitting and financing requirements. For projects where significant BES risks are apparent (e.g. high-risk sectors operating in biodiversity rich environments) the ESIA process should specifically address BES risks (including direct, indirect and cumulative aspects). This may necessitate the appointment of specialists (especially where there are interactions between biodiversity and social issues). BES assessment may take time (often up to a year) and can affect decision and investment timetables;

Client Risk Assessment (CRA): Most institutions will have developed CRA tools to determine a client's credit worthiness and it may be the case that the addition of specific questions relating to a client's commitment, capacity and track record on environmental and social issues is all that is required. Emerging industry-standard due diligence include questions around:

- **Commitment:** Evidence of policies, management systems (which reflect the full scope of BES risks – including third parties and supply chains) accountabilities and responsibilities, disclosure and reporting;
- **Capacity:** Evidence of training and head count for effective management of BES issues, and capacity for stakeholder engagement on these issues;
- **Track record:** Evidence that management of BES risks has improved over time, demonstration of compliance with regulations, effective stakeholder engagement (including local communities and, as appropriate, international NGOs).

Environmental Audit: For existing projects or assets, an environmental audit helps to clarify whether there are specific liabilities or risks that need to be factored into credit and other decision making. Where the asset/activity is associated with natural habitats or biodiversity (including through the sourcing of materials such as timber), it is important to specifically include BES aspects in the scope of the audit.

Tools for Risk Management

Biodiversity Action Plan (BAP): In situations where a project has a potentially significant impact on biodiversity, a BAP may be an appropriate vehicle through which risks can be managed over the course of the transaction/life of project. A BAP serves to (i) define biodiversity impacts associated with a transaction; (ii) determine how impacts can be mitigated; (iii) establish the baseline and identify key performance indicators; and (iv) identify responsibilities and resource needs for management. BAPs are increasingly being used in loan documentation (both as conditions of disbursement and covenants) to maintain leverage over the course of the transaction.

The potential application of these tools and their utility in various financial services is outlined in Figure 7.

Figure 7 **Financial Products and Risk Management Tools**

Product/Services	Risk Management Tools and Procedures
Project Finance and Trade Finance	<p>Establishing internal policy and procedures that recognise BES as a material risk to the institution;</p> <p>Developing checklists, risk overlays (including maps) and screens to highlight risks associated with specific industry sectors;</p> <p>Applying Equator Principles for project finance and advisory services (including the use of ESIA and BAP tools to assess and manage BES risks and opportunities) and also stakeholder consultation processes as part of ESIA.</p>
Corporate Finance	<p>Encouraging clients to establish an effective environmental management system (with a focus and key performance indicators that track BES performance alongside other aspects of environmental performance). While BES aspects and management needs can be delivered through ISO 14001, care needs to be taken if this standard is used to manage BES performance since auditors may not be fully familiar with BES issues. (there is a tendency for auditors to have stronger experience in the traditional “brown” environmental management areas of waste water, energy use and hazardous materials management);</p> <p>Using Client Risk Assessment tools that focus specifically on BES capacity, commitment and track record.</p>
Asset Management	<p>Using Client Risk Assessment tools which incorporate BES capacity, commitment and track record;</p> <p>Supporting the work of buy-side analysts that make use of research produced by specialised research institutions that consider environmental, social and governance issues as part of investment recommendations (for example, F&C and Insight Investment work described in Box 6);</p> <p>Benchmarking BES (measuring companies’ biodiversity performance against criteria on their governance structures, policy, management and implementation, and assurance and monitoring²³);</p> <p>Using index-based portfolio management such as the Dow Jones Sustainability Index which evaluates a company’s capacity in managing biodiversity for selected sectors (aluminium, real estate, mining, building materials, transport, water, travel and tourism, pipelines, oil, gas and coal companies, gas and utilities);</p> <p>Client engagement and proxy voting to encourage positive change in behaviour in relation to BES.</p>
Institutional Investors and Others	<p>Encouraging sell-side analysts to take extra-financial issues (including BES) into account when making investment recommendations through participation in the Enhanced Analytics Initiatives²⁴.</p> <p>Direct engagement with investee companies involved in activities with significant BES impact, (e.g. Co-operative Insurance approached all companies it invests in to ensure that they are aware of the potential pitfalls if they are engaged in the biofuel sector);</p> <p>Use of the UNEP FI toolkit covering 10 industry sectors which contain references to help identify impacts on BES (http://www.unepfi.org/toolkit).</p>

4 Business Opportunities

Concurrent with the growing BES risk management needs of the financial sector, a range of investment and lending opportunities have emerged that support the financing of businesses which actively promote BES. It is clear that these opportunities are moving beyond niche products and services that require subsidy and other “soft” financial support, to mainstream opportunities for large scale financial products and services.

Opportunities for New Financial Products

Opportunities associated with carbon and water markets are attracting attention from mainstream finance. These markets are underpinned by fundamental and long-term changes in the valuation of ecosystem services. Biodiversity and landscape protection opportunities (increasingly a vehicle through which a range of income streams can be managed to deliver BES benefits and an acceptable rate of return to commercial investors and financiers) are also gaining interest from commercial funds for similar reasons.

Products associated with the emerging market for forestry-linked carbon credits and low carbon technologies have increased significantly (supported by growing evidence that intact forests can generate long-term value). This value will grow in the light of the expectation that avoided deforestation will become eligible for carbon credits in the near term. The World Bank estimates that deforested land in the tropics is worth US\$200-500 per hectare as pasture and could be worth from US\$1,500-10,000 if left intact. Similarly, a recent study by the Pembina Institute for the Canadian Boreal Initiative found that carbon stored in Canada’s boreal forests and peat lands is worth US\$3.7 trillion, while the annual value of ecosystem services such as water filtration, pest-control services, and carbon storage is valued at US\$90 billion (roughly 2.5 times the net market value of forestry, hydroelectric, mining, and oil and gas extraction in Canada’s Boreal region). Public and private payments for watershed services is another area of opportunity; these are predicted to increase from a current estimate of US\$1.5 billion to US\$3 billion in 2010 and US\$30 billion by 2050.

The BES market is not without its challenges (including uncertainty over cause and effect, attribution of benefits, and long-term time horizons for some services), but as the market consolidates and returns become clearer these barriers to business seem likely to decline.

Differentiation and Branding

Financial institutions are using biodiversity to differentiate brand and attract new business. In December 2006, HSBC pledged to contribute £2 for every on-sale product sold to environmental and conservation groups. Not only was the latest Green Sale HSBC’s most successful January sale to date, exceeding targets in almost all products, it significantly increased the number of people considering opening an account with HSBC – from 20% of those surveyed to almost 30%, according to the Bank.

Similarly, in 1990 Nedbank, together with conservation organisation WWF-SA, founded the Green Trust, which aims to protect the biodiversity of southern Africa. Nedbank makes a donation to the Trust whenever clients use specific banking products associated with this initiative. In this way, Nedbank attracts new business, and conservation efforts get new sources of funding. Since inception in 1990, the Trust has raised over R75 million and supported over 140 projects working closely with WWF-SA’s ecosystems programme.

New Investment Opportunities

The opportunities that are beginning to emerge around biodiversity (and particularly payment for ecosystem services - PES) based businesses seem set to become a significant “pull” factor for the financial sector in the near term. Initiatives such as the Ecosystem Market Place , Forest Carbon Facility , emerging consumer demand for ‘sustainable’ products and interest in the potential for market-based regulation of ecosystem services stimulated by emerging carbon markets are helping to define opportunities for the financial sector, but until recently these opportunities have tended to be small, often offered lower rates of return than commercial banks were prepared to accept, and/or relied on subsidies and grants (Box 8).

Box 8 Small and Medium sized Enterprise (SME) Development

Initial opportunities in BES businesses have often been small-scale and subsidised investments that are essentially testing the market for enterprises relying directly or largely on biodiversity (including supply of non-timber forest products, payments for watershed protection or carbon sequestration, sustainable agriculture and sustainable forestry). A range of innovative financing mechanisms (with the objective of demonstrating that adequate financial returns can be achieved and BES benefits realised) are making the case for BES based businesses. For example:

- The recently launched “Finance Alliance for Sustainable Trade” (FAST) which aims to facilitate lending to businesses that promote responsible natural resource management, community-based development and sustainable trade in BES goods and services (and also enhance financial literacy within small scale enterprises);
- The World Resources Institute ‘New Ventures’ programme which aims to promote sustainable enterprise amongst SMEs by building capacity and developing a set of tools to support SMEs.

Shell Foundation and IUCN, PwC and WWF, the EBRD, RSPB and the European Centre for Nature Conservation are all evaluating the barriers and opportunities around such financing initiatives. The European Union has also commissioned a study led by Fauna & Flora International to evaluate means by which such barriers could be overcome.

Opportunities linked to carbon management, emerging markets and the growth of biofuels, and insurance needs are arising, such as the commitments made by Citigroup and Bank of America totalling US\$70 billion for financing climate change programmes (which will include investments in forest and land management), the increasing focus on the sustainability aspects of biofuel financing and the \$150 million bond issued by Allianz, the German insurer to insure against flood damage in the City of London and the Canary Wharf.

Currently PES schemes have proved most viable in the provision of carbon sequestration, water management services, biodiversity conservation and landscape protection (Figure 8), and opportunities in these and other BES businesses will deepen and expand as a result of:

- **Increasing legitimacy and financial returns associated with carbon markets:** Including avoided deforestation where carbon credits can potentially be secured for conserving forests (i.e. preventing them from being logged and retaining carbon in the forest rather than allowing conversion to GHGs). Clearly, the opportunity to link avoided deforestation, carbon credits and biodiversity protection offers win-win options for some businesses and financial institutions;
- **Growing realisation within the financial sector that ecosystem services can provide an acceptable rate of return (especially if linked to other income streams):** Increasing pressures on water supply and quality seem likely to create markets for landscape and catchment level water management programmes. These have already been developed for the Panama Canal and a growing number of the world’s major cities (including New York, Jakarta, Mumbai, Tokyo, Singapore, Rio de Janeiro, Barcelona, Sydney and Los

Angeles) receive water from protected forests and watersheds. Investors with long-time horizons (five years plus) will find investments in protected watersheds and catchments an increasingly attractive option as water demand grows and water supply becomes more precious;

- **Growing interest in “sustainability” funds and enterprises:** These provide an investment vehicle for individuals and institutional investors making specific commitments to businesses that are based on BES. These types of enterprises seem likely to increase rapidly as threats to BES become more widely understood;
- **Legal and regulatory environment:** This stimulates PES including wetland banks in the USA (an estimated US\$1 million annual market). Similar programmes that essentially value PES impacts and require compensation for losses are evident elsewhere including South Africa and Australia;

Box 9 High-net-worth individuals and a Green Planet

Socially responsible investment [...] creates innovation and new processes that enhance relationships, builds loyalty and retains clients/employees, grouped by a common interest. For many, this is a new approach – quite different from the ordinary product selection process. Investments made under these criteria show engagement in a better society instead of apathy regarding major issues and concerns that humanity is facing. It is also an opportunity to have a fruitful dialogue with new money while keeping an eye on old money that was earned under a different philosophy.

Countries such as India, China, Russia and Brazil will drive the world down a different path as their need for food, water, consumer goods, wealth accumulation and energy etc grows at a very fast pace. That demand will create opportunities to several financial institutions to serve a new class of savers, borrowers and investors searching for financial aid and assistance.

This is especially true within the progressively growing private wealth management markets both in developed and developing countries. An explosion of globalisation-induced wealth accumulation and a rapid shift of values and lifestyles among the respective elite, coupled with fierce competition among private banks and family offices, are already giving a competitive advantage to those institutions that better align financial performance with environmental/social returns within their products and offerings.

According to the Merrill Lynch/Capgemini 2006 World Wealth Report, in 2005:

- 8.7 million people globally held more than US\$1 million in financial assets (an increase of 6.5% over 2004)
 - The wealth of high-net-worth individuals (HNWIs) totalled US\$33.3 trillion (representing growth of 8.5% since 2004)
 - HNWI financial wealth is expected to reach US\$44.6 trillion by 2010, growing at an annual rate of 6.0%
 - South Korea, India, Russia and South Africa witnessed the highest growth in HNWI populations
- Deutsche Bank Wealth with Responsibility Study (2000):

HNWIs collectively hold approximately 4% of their assets invested in ESG-inclusive investments.

- 51% of clients have considered ESG-inclusive investment
- 44% currently invest in some kind of ESG-inclusive investment
- 32% find the concept attractive

UKSIF research to size the bespoke HNWI ESG-inclusive market (2005):

- UK private client advisers Cazenove, Gerrards, Henderson, Jupiter and Rathbones concluded that 6–10% of their HNWI clients by assets were in bespoke ESG-inclusive portfolios

Assuming that the interest among HNWIs globally for ESG-inclusive investment strategies remains flat between 2000 and 2010 at approximately 5% of their wealth, then the opportunity for ESG-inclusive investments for private clients would currently be US\$1.6 trillion, rising to US\$2.2 trillion in 2010.

- Staff commitment and interests:** It is clear from a number of FIs, that staff is committed to biodiversity initiatives and programmes (directly through voluntary contributions, as well as staff exchanges and volunteer programmes). HSBC leverages the interest that employees have shown in biodiversity via a partnership programme with the NGO Earthwatch, which provides opportunities for HSBC staff to undertake research and other activities in support of biodiversity globally. These initiatives underpin latent commitment and interests that FIs can leverage for biodiversity based investments;
- Quality of data and financial analysis:** As the extent and quality of information on BES risks and opportunities increases, more informed decisions will be possible. In many ways, this situation is similar to the one encountered by analysts working on climate change and GHG issues over the past five to ten years where a deficit of credible information created uncertainty. In response, a range of research and analytical work now underway seems likely to clarify some of these uncertainties in the near term

Figure 8 **Payments for Ecosystem Services – Successes to Date**

Ecosystem Service	Business Case	Examples of Potential Market Opportunities
Carbon Markets	<p>Trading in carbon via Certified Emission Reductions (CER) (or similar credits) is already estimated to represent a US\$1 trillion marketplace, with a parallel voluntary offset market (mainly for companies) also emerging. While carbon prices remain variable, and there is uneven global commitment with varied approaches to establishing and managing carbon markets and exchanges, it is clear that the world is moving to a carbon-constrained economy. The role that the financial sector is already playing in the provision of finance for new technologies, intermediating financial flows and transition costs, and related services has already been clearly and well articulated by UNEP FI³⁶</p> <p>A range of FIs have established carbon funds or services to capitalise on the emerging market of pricing and trading carbon³⁷. Where these are used to promote forest management (especially through avoided deforestation) or conservation of other carbon containing habitats e.g. peatland) they could have potentially significant broader and direct benefits for biodiversity and could also create new/additional income streams from other businesses.</p>	<p>Managing carbon in Bolivia: Carbon emission offsetting is being used in conjunction with avoided deforestation to protect forests and conserve biodiversity adjacent to the Noel Kempf National Park in Bolivia where an estimated 17.8 million tons of avoided emissions is predicted and a range of alternative and additional income streams have been developed for local communities to create broader economic benefits and local support for the initiative; Bolivia’s annual deforestation rate of 270,000 hectares would produce at least 18 million tonnes of carbon emissions per year. Based on recent market rates for carbon, Bolivia’s avoided deforestation would be equivalent to the value of €737 million per year³⁸.</p> <p>A range of projects that are delivering potential or actual biodiversity benefits via carbon management programmes (and which would potentially be appropriate vehicles for financing) are also included at the Climate, Communities and Biodiversity Alliance website - http://www.climate-standards.org/projects/index.html and similar prospects are also being delivered via the United Nations Development Programme (UNDP) MDG Carbon Facility (http://www.undp.org/mdgcarbonfacility/).</p>

Ecosystem Service	Business Case	Examples of Potential Market Opportunities
<p>Watershed Management</p>	<p>Payments for watershed services have already financed water management in New York on a commercial basis, and has more recently been used by the water and utility companies Vittel and United Utilities to help secure long-term supply for their operations in France and the UK, respectively. As climate change and water demand squeeze supply in many regions opportunities for long-term investment will increase. In the same manner innovative funding to manage flooding, water supply and pollution control (via wetlands) is being developed in a range of locations.</p> <p>Financing opportunities to implement and install water conservation and re-use technologies across a range of industry sectors (the use of drip irrigation in agriculture, recycling waste waters in a range of manufacturing industries, and water efficiency measures for domestic supply) will also provide new business and financing streams.</p> <p>The case for payments for water (and other) services is growing, but will in the near-term continue to have relatively high transaction costs (particularly in relation to the acquisition of legal title/use rights, the attribution of cause and effect, and capacity building to change current land-use practices). There is still scepticism that PES can deliver reliable and acceptable financial returns in some quarters, but it seems likely that the factors described in the main text will pull the PES market increasingly into mainstream financing.</p>	<p>Assuring New York’s water supply: The Catskill, Delaware and Croton watersheds together deliver 4.9 million litres of water/day to New York’s citizens. Planners calculated that it was cheaper to purify water through natural ecosystems and watersheds than to construct water treatment works. However, since land ownership and management in these catchments is diverse, a range of planning, regulatory and fiscal controls have had to be established to ensure that water continues to be supplied to New York in a sustainable and cost-effective fashion. As demand for water grows in New York and other urban areas, the compelling case for watershed management as a vehicle for delivering and maintaining water supply is certain to grow. As it does, financing needs will also grow via a range of products and services (including bonds and loans predicated on good land use management).</p> <p>Securing long-term business supply – the case of Vittel and its water supplies: Vittel has secured commercial relationships with 26 farms (covering 1,700 ha) in northern France to protect the watershed and ground water supplies from agrochemicals. Importantly the company paid for the transaction costs of changing land-use and farming practices to maintain water quality³⁹. The role that financial institutions can play in intermediating and enabling this sort of market based PES will become increasingly significant.</p> <p>Watershed management bonds in Central America: In Costa Rica, the government has developed a nationwide PES scheme through which users (for example hydropower companies) can pay land owners and users to maintain forest cover in watersheds. The Re-insurer ForestRe, working with the Smithsonian Tropical Research Institute, is developing a 25-year bond to pay for reforestation, which will improve regulation of water flow into the Panama Canal, trap sediment and nutrients, and reduce dredging costs. A Panama Canal Authority report showed that two-thirds of the insurance risk is environment related. Reforestation will cut insurers’ exposure to environment-related risk, while users of the canal, currently buying expensive insurance against the losses they would suffer if the canal were to close, will pay a reduced insurance premium when they buy the forest bond, the insurance premium will also pay for the bond’s coupon obligations.⁴⁰</p>

Ecosystem Service	Business Case	Examples of Potential Market Opportunities
<p>Biodiversity Conservation and Landscape Protection</p>	<p>Wetland and endangered species mitigation banking in the USA is an established and increasingly attractive investment opportunity which has been underpinned by state and federal legislation requiring that losses of wetlands and endangered species need to be compensated. There is now evidence that these opportunities are spreading beyond the land banking and conservation easements that are supported by regulation, to broader market opportunities based on a variety of income streams (including water, soil, sustainable agriculture and eco-tourism). The hedging of income streams from multi revenue land management is an important and stabilising factor for many of the newer funds and schemes.</p> <p>Many of the markets and opportunities for biodiversity and landscape conservation are new and not fully formed. There may be a higher degree of risk, and there is almost certainly a requirement for longer term investment horizons (which may suit the needs of pension funds and other institutional investors). Notwithstanding these caveats, «land banking» seems likely to emerge as a credible and real market as the basis for BES valuation and returns becomes substantiated.</p>	<p>Wetland and forest banking: In the USA, private equity fund Parthenon has recently invested in a wetland mitigation banking company (Wildlands Inc.) and is assuming investment returns between 20-30%, and Ecosystem Investment Partners proposes to invest US\$ 27.5 million across a variety of landscapes that will generate multiple revenue flows (including timber, water supply and biodiversity) which buy down individual risks associated with particular income streams. Aurochs Investment (launched in the UK in June 2007) represents another fund that aims to acquire and manage land to protect biodiversity value in particular – with an assumption that returns of 20% are realistic for revenue generated by high-end cattle grazing, fair trade products and eco-tourism. The Ecosystem Marketplace (www.ecosystemmarketplace.com), operated by Forest Trends, estimates the total market value of wetland credits at nearly \$290 million as of April 30, 2005⁴¹.</p> <p>Species banking: Currently, about 50 banks operate in the United States. Many of these have received substantial returns from credit sales, and there are successful for-profit businesses with the sole purpose of establishing species banks. Credit prices in banks range from \$3,000 to \$125,000, with each credit typically representing one acre of habitat. Individual endangered species themselves can, as a result, generate significant return – the Red Cockaded Woodpecker, for example, in California can command individual credits ranging from US\$150,000 – 250,000⁴². Such schemes are contingent on the appropriate legal context – in this case the Endangered Species Act⁴³.</p> <p>Eco-securitisation: The International Finance Corporation (IFC), the UK's Department for International Development and commercial institutions initiated a project in June 2006 to test the feasibility of financing 'natural infrastructure', such as forestry, by linking sustainable forest management with the funding capacity of asset-backed securitisation. For instance, payments for forest services, such as carbon sequestration, biodiversity, eco-tourism and rural development, are captured in an offshore special purpose vehicle, which becomes the legal owner of the forest assets, and used as the collateral to issue securities. The security would be sold to both institutional and retail investors. Instead of earning money by logging the forest, the government preserves the rainforest and raises money from the value of the ecosystem services the forest provides.⁴⁴.</p>

5 Recommendations

Both the risks and opportunities that the financial sector faces in terms of BES are potentially significant. Risks, in particular, have proven materiality and have caused a growing number of financial institutions to look closely at how they can integrate BES assessment within wider credit and risk management procedures. This section presents guidance and a series of suggestions (at the level of individual institutions, the financial sector as a whole, and for policy makers) which provide a route map for further action.

Actions for the Financial Sector as a Whole

Given the public good nature of biodiversity, it may be easier in some instances for the financial sector to address aspects of BES via collective action which responds to key questions and needs at a strategic level.

“Citigroup states that illegal logging is an increasing threat to critical forest ecosystems worldwide, as well as economies and human rights... With assistance from external experts and NGO partners, it has developed a workshop series for its bankers and portfolio managers involved in the forestry sector... in Malaysia, Brazil, and New York in 2007.”

Increase consistency and clarity in financing and investment requirements: Clarifying and making consistent the lending and investment requirements sought by the financial sector will be important for the sector to effect change at any scale and with speed. UNEP FI, PRI and the Equator Principle financial institutions (EPFI) community might act as suitable fora for these discussions which should be convened with the intent of:

- **Promoting consistency in consideration of BES aspects of financing and investment:** This aspect is particularly important where FIs are considering financing in areas of weak governance (and where they may be drawn into roles as quasi regulators) and also the role that FIs can play in enabling industry good practices to emerge in key markets globally;
- **Develop BES principles and criteria across different financial services:** As is happening with forestry investments);
- **Developing and promoting the use of clear, simple and practical guidance and checklists:** For use by transaction teams and the common application of tools and metrics. It may be appropriate to work with other industry groups (see Annexe 1), since these groups are, in some instances, concurrently developing appropriate “best practice” materials, providing a single ‘one-stop-shop’ of sector specific guidance, (one initiative that aims to achieve this for the asset management sector is the Natural Value Initiative see Box 10). A review of UNEP FI and UN PRI materials to ensure they consistently and clearly flag BES issues would also be appropriate;
- **Engaging in the Potsdam Initiative:** To ensure that the needs of the financial sector are understood, but also to map out a framework for investment and lending that can support and enable wider action on BES management (this might also provide a link between the commitments that financial institutions are making in relation to climate change);
- **Building the business case for PES opportunities:** Linked to the Potsdam Initiative, efforts should be made to clarify and substantiate the scale of PES markets (perhaps focusing on water use and landscape/biodiversity opportunities in the first instance);
- **Collaborating to establish criteria for evaluating country-based BES risks:** Which can become incorporated in country risk rating systems;
- **Developing and sharing information on partnerships:** With NGOs, research institutes and private companies to deliver BES benefits. There is much to be learnt from existing successful initiatives such as the Energy and Biodiversity Initiative that would help the financial sector as it grows into a more proactive role in financing/investing in effective BES management;

■ ***Integrate understanding of environmental and BES risk into business school curricula:***

Encouraging business schools/financial training bodies to adequately encompass environmental issues including BES in the training of the next generation of analysts and finance specialists.

Coordinate and integrate research efforts: Underpinning the above there is a pressing need to more clearly define and articulate the financial risks and opportunities associated with BES. The role that shared research can play is currently underutilised and there is limited opportunity for the financial sector to learn collaboratively about successful and cost-effective risk management. Insight Investment and F&C have produced important work, and it is clear that other institutions (including Goldman Sachs and JPMorgan Chase) are also undertaking research into BES. Whilst it is unrealistic to expect institutions to share information about BES opportunities, there is a real opportunity to share findings on BES risk management requirements (as has proved the case with the EPFI community). Research should ideally build off the economic analysis and valuation work on BES that will emerge from the Potsdam Initiative.

The issues above will be considered by the UNEP FI Biodiversity and Ecosystem Services (BES) work stream and an action plan drawn up to address them.

Box 10 **The Natural Value Initiative**

The Natural Value Initiative (NVI) is multi-stakeholder collaboration which aims to develop and test a tool to provide a rigorous evaluation of biodiversity related risks and opportunities for investment decision making. The key institutions involved are UNEP Finance Initiative, international NGO Fauna & Flora International, and Brazilian business school FGV.

The tool is aimed at identifying BES risk within the food, beverage and tobacco sectors, which can then be fed into financial organisation's investment decision making processes, thereby reducing investment risk and increasing returns. For the agricultural sector, this will provide a strategic framework against which issues-based or commodities-based initiatives can be placed to facilitate prioritisation and enable more effective communication with an increasingly engaged finance sector, thereby rewarding good practice in a way that is not currently achieved.

The benchmark is based on established risk management processes and asks a series of questions regarding the presence within a company of appropriate governance procedures, policy and strategy, management tools and monitoring and assurance procedures to allow understanding and management of biodiversity impacts.

Actions for Individual Institutions

Understand the scope and scale of BES risks: Review portfolio and business lines for current and future exposure to BES risks. Such a review might sensibly include specific assessment of the carbon exposure in the institution's portfolio since this will become a material liability to some clients in the near term. The scope of material risks is however likely to be broader than carbon and will necessitate wider assessment. Tracking emerging issues and regulations (e.g. avoided deforestation and the requirements that may emerge from the Potsdam Initiative) will be important for institutions with significant BES risk and exposure.

Develop BES policy and procedures where risks (and opportunities) are evident: Where material exposure is evident now or is likely in the near term (ecosystem service challenges such as water supply, flood and storm damage, seem likely to become significant drivers of risk for certain countries and regions within the next decade), consider needs for policy and/or guidance to inform the institution's investment and lending practices. In many instances, BES risks can be effectively represented in an institution's existing credit risk process

and there is unlikely to be a need for substantive new procedures and processes if the institution has already developed general environmental and social risk management needs.

Develop and implement BES tools, guidance and training: For key industry sectors or regions, consider the need for specific guidance and decision-making tools (checklists, client diagnostics and risk assessment tools) and training needs for relationship managers and transactors. It seems likely that as BES moves from a public property issue to a more regulated requirement (a likely outcome of the Potsdam Initiative), opportunities for BES based business and investments will become apparent, and specific tools, market intelligence and training will become important in building awareness of markets and investment opportunities.

Consider forming partnerships to manage BES risk and identify opportunities: With civil society (such as conservation NGOs) and research institutions that are key players and often have significant information and experience in BES assessment and management (but may not always have a full understanding of the role and leverage that the financial sector can bring to biodiversity issues). Thus, there is an opportunity for mutual learning and partnerships in the delivery of BES risk management and also increasingly in the delivery of BES opportunities. Two emerging initiatives in this area are the Corporate Environmental Services Review under development by the World Resources Institute and the Natural Capital Project run out of Stanford University which aims to map the economic value of ecosystem services around the globe and encourage uptake of this information into resource management and investment decisions.

Promote the use of leverage via clear compliance requirements and transaction conditionalities: Where compliance is sought on BES issues, consider how best to maintain leverage in transactions (through for example, disbursement conditions and covenants). Consider developing specific “boilerplate” language for BES issues to increase consistency in the use of conditions and also reduce transaction time and costs.

Actions for Governments and Policy Makers

To help enable a common basis for action within the financial services industry, governments and policy makers should clarify the requirements and conditions necessary for investment, and encourage the development of market-based mechanisms that support the sustainable management and use of biodiversity and ecosystem services. In particular they should:

- Recognise the urgency of action to address BES losses and make requirements explicit in planning and economic development policies;
- Work with the financial sector and others to ensure that policies reflect practical challenges and integrate the needs of the financial sector and others;
- Support research on the economic and financial impact of BES loss/damage and the development of enabling mechanisms that create markets for ecosystem services;
- Integrate BES assessment explicitly in public policy development and include the costs of BES loss/ degradation, as well as the benefits of BES management into policies and programmes, in particular, the impacts of subsidies and tariffs on BES globally.

Annexe 1 A Sector Overview of Biodiversity Risks

Industry Sectors	Major Risks to Biodiversity	Attendant Risks to Business
Agriculture and Biofuels ⁴⁸	<p>Conversion of natural habitats and marginal land being brought back into production (biofuels is a major driver of both);</p> <p>Indirect risks, e.g. through changes in water quality and quantity to downstream users or cumulative issues;</p> <p>Land use change (generally conversion from natural state) or farming systems (livestock and rice) resulting in significant GHG emissions;</p> <p>The introduction of alien species as part of production or pest management systems;</p> <p>Use of agrochemicals without an integrated pest management system and without a full assessment of input requirements.</p>	<p>Reduced production and profitability from the failure to implement better/best management practices in relation to soil and water management (resulting in damage to soil through mechanisation, poor farming practices and lower production, and over abstraction and use of water, drainage of wetlands, and salinisation);</p> <p>Lost revenue and productive capacity because of failure to assess the real economic costs of farming marginal lands;</p> <p>Loss of access to markets and finance if poor practices are more widely reported.</p>
Construction and Building Materials (including cement) ⁴⁹	<p>Cement production uses large quantities of limestone as raw materials and the mining of this can be extremely damaging to biodiversity associated with limestone habitats. Additionally cement production is major emitter of GHGs with attendant climate change risks. Mitigation of emissions and impacts to limestone habitats should be considered;</p> <p>Mining for other construction materials (rock, gravel, sand) and also the use of timber can have biodiversity impacts if sourcing from areas of biodiversity and/or ecosystem service value.</p>	<p>Loss of access to land and resources and reputational damage;</p> <p>Constrained production and operational efficiencies as carbon controls and limits become more demanding;</p> <p>Long-term sustainability of operations will be affected where renewable natural resources (such as timber) are an important element of company products.</p>
Electricity Generation and Supply ⁵⁰	<p>Power generation involving fossil fuels adds to atmospheric carbon and is a significant contributor to GHGs;</p> <p>Power generation can also have significant effects on the biodiversity of water courses (through the discharge of heated cooling waters);</p> <p>Roads and transmission corridors for power lines, can fragment habitats and allow increased access to previously undeveloped areas, leading to potentially significant impacts from land conversion, small-scale mining, hunting and logging;</p> <p>Wind turbines may adversely affect wildlife, particularly birds.</p>	<p>Loss of access to land and resources and reputational damage;</p> <p>Profitability of hydro operations may be affected by reduced capacity in reservoirs (as a result of catchment land use change and soil erosion), as well as changing rainfall. Drainage arising from climate change;</p> <p>Public campaigns and action against large emitters of GHGs;</p> <p>Thermal power generation will be affected by GHG emission limits and potentially liabilities.</p>

Industry Sectors	Major Risks to Biodiversity	Attendant Risks to Business
Food, Beverages and Pharmaceuticals ⁵¹	<p>The primary risks associated with this sector are via supply chain impacts associated with food, beverages and pharmaceuticals production. These may be diverse and complicated (for example water use to grow grain for chicken feed);</p> <p>Particular care needs to be taken when prospecting for pharmaceuticals (and new varieties of foods) since intellectual property rights in relation to biodiversity may need to be met;</p> <p>The other key biodiversity risk associated with this sector relates to “food miles” (the distance travelled by food items and the carbon/GHG burden they have accumulated), and embedded water (the amount of water required to produce a product/food products – for example 11,000 litres of water for a pair of jeans, and 400,000 litres for a car). Options for offsetting carbon emissions associated with food miles is an area in which many retailers and food producers are currently exploring.</p>	<p>Reputation and market access drivers will increasingly affect both retailers and supply chains;</p> <p>Security of supply (for fish and some types of timber) is increasingly an issue;</p> <p>Forward looking retailers and food producers are beginning to assess environmental and social impacts through the supply chain, but to date these have largely failed to assess biodiversity issues (except where there are clear and widely recognised risks – for example oil palm and fisheries). BES impacts are far more widespread than generally recognised and environmental management systems should specifically include supply chain BES risk capacity.</p>
Forestry and Paper ⁵²	<p>The primary risk is from the unsustainable and illegal harvesting of natural forest in emerging markets (with impacts on BES and local communities);</p> <p>Additionally there are often significant impacts on soil and water biodiversity from forestry/ logging operations, and GHG emissions from conversion and logging;</p> <p>Indirect impacts (particularly relating to improved access to previously inaccessible areas which encourage new settlements and activities - including hunting and illegal logging) may also be an issue in some locations;</p> <p>For plantations, biodiversity impacts arise as a result of the conversion of original habitats to plantation (and use of non native species) and ecosystem changes resulting from large scale plantation development (particularly water availability);</p> <p>For pulp mills, in addition to assurance needs relating to the sourcing of wood supply (legal, from sustainable sources) GHG emissions from pulp mills and effluent quality can affect biodiversity.</p>	<p>Access to capital is becoming more complex for forestry and paper companies that cannot demonstrate sustainable practices;</p> <p>Reputational and market access issues are also becoming more significant;</p> <p>For some types of wood, security of supply is also becoming an issue as natural stocks are depleted;</p> <p>Certification under an acceptable and credible forest management programme is becoming an essential ticket to market for producers wishing to sell in W Europe and the USA;</p> <p>The social issues related to land tenure and access to BES for local communities are also important in many emerging markets.</p>
Leisure & Tourism ⁵³	<p>The siting of hotels and resorts (particularly if these are located in coastal or mountain areas) can have BES impacts through direct loss of habitat and also a range of indirect and cumulative impacts (the sector is particularly prone to cumulative biodiversity risks as a result of the development of a number of resorts/ hotels owned and operated by different companies in close proximity);</p> <p>Linked to resort development, there are often BES impacts associated with supporting infrastructure and recreational facilities (including airports, waste water treatment facilities, power plants and golf courses) which can have a range of indirect BES impacts.</p>	<p>Access to land is becoming more complicated and stronger evidence that hotels will be developed in a sustainable fashion is becoming important;</p> <p>Reputational risks to operators (who may not be the developers of assets) is increasing as green branding becomes a significant part of a hotels brand;</p> <p>Potentially loss of fundamental source of revenue (e.g. if coral reefs are destroyed).</p>

Industry Sectors	Major Risks to Biodiversity	Attendant Risks to Business
Mining ⁵⁴	<p>Land take and habitat conversion from exploration and extraction – including associated facilities such as access roads, tailings dams;</p> <p>It is estimated that three quarters of active mines and exploration sites overlap areas of BES value⁵⁵</p> <p>Induced impacts from increased access to remote areas (in-migration, artisanal mining by third parties, increased hunting, and clearance of natural habitat by third parties);</p> <p>Water use and quality often decline as a result of acidity and elevated levels of suspended solids which can have significant impacts on downstream BES and local communities who depend on these natural resources.</p>	<p>Legacy issues associated with poor closure practices and the risks of incidents which release large volumes of polluted water with BES impacts will restrict access to new sites and may tarnish the industry more broadly across regions and countries⁵⁶;</p> <p>Access to new land and access to capital increasingly viewed through the lens of sustainability (including BES issues);</p> <p>Liabilities and clean up costs associated with long-term pollution and ecosystem damage (e.g. tailings dams collapse and acid mine drainage) will increase.</p>
Oil and Gas ⁵⁷	<p>Land take and access to remote areas during exploration: There are numerous examples of recent exploration and production programmes which have had impacts in areas of high biodiversity (on and offshore). Concerns about the impacts on deep water biodiversity from offshore extraction are increasing (and concerns about the impacts of seismic testing on whales and other cetaceans are also noteworthy in some regions);</p> <p>Pipeline and road development which can fragment habitats and, more importantly, increase third party access to previously inaccessible areas;</p> <p>The transport of alien marine species in ballast waters has had extreme impacts to native biodiversity and knock on effects on local and even national economies;</p> <p>The exploration and production of oil and gas creates significant GHG, and pollution risk from transport, processing and production are concerns.</p>	<p>Access to new land and access to capital increasingly viewed through the lens of sustainability (including BES issues);</p> <p>Liabilities and clean up costs associated with long-term pollution and ecosystem damage (including potentially attribution for responsibilities for climate change) will increase.</p>
Water Utilities ⁵⁸	<p>Building of dams for hydroelectric power can profoundly affect biodiversity through loss of terrestrial habitats, restriction of fish migration, and induced effects on catchment land use as a result of reservoir and water supply opportunities;</p> <p>Excessive water abstraction to service demand lowers soil water tables, which can affect wetlands, soil chemistry and river flows;</p> <p>Inter-catchment transfers can address water imbalances between regions, moving water between catchments risks the introduction of alien species as well as more subtle changes in water chemistry and temperature.</p>	<p>Loss of access to land and resources and reputational damage;</p> <p>Reputational risk are becoming more significant and financing will become more complex for company's that do not subscribe to international good/best practices (such as those espoused by International Hydropower Association);</p> <p>Profitability of hydro operations may be affected by reduced capacity in reservoirs (as a result of catchment land use change and soil erosion), as well as changing rainfall.</p>

Abbreviations

BAP	Biodiversity Action Plan
BSR	Business for Social Responsibility
BES	Biodiversity and Ecosystem Services
CBD	Convention on Biological Diversity
CER	Certified Emission Reduction
CRA	Client Risk Assessment
CoP	Conference of Parties
EBRD	European Bank for Reconstruction and Development
ESIA	Environmental and Social Impact Assessment
FI	Financial Institution
FFI	Flora and Fauna International
GHG	Green Hous Gases
IFC	International Finance Corporation
IPO	Initial Public Offering
IUCN	The World Conservation Union
MDG	Millennium Development Goals
NGO	Non Governmental Organisation
PES	Payments for Ecosystem Services
PRI	Principles for Responsible Investment
PwC	PricewaterhouseCoopers
RBS	Royal Bank of Scotland
RSPB	Royal Society for the Protection of Birds
SME	Small and Medium-sized Enterprises
UNEP	United Nations Environment Programme
UNEP FI	United Nations Environment Programme Finance Initiative
WRI	World Resources Institute
WWF	World Wide Fund for Nature
WWF-SA	World Wide Fund for Nature – South Africa

References

- 1 Andrew Balmford, Aaron Bruner, Phillip Cooper, Robert Costanza, Stephen Farber, Rhys E. Green, Martin Jenkins, Paul Jefferiss, Valma Jessamy, Joah Madden, Kat Munro, Norman Myers, Shahid Naeem, Jouni Paavola, Matthew Rayment, Sergio Rosendo, Joan Roughgarden, Kate Trumper, R. Kerry Turner (2002) *Economic Reasons for Conserving Wild Nature*. Science 9 August 2002:Vol. 297. no. 5583, pp. 950 – 953.
- 2 World Wide Fund for Nature (WWF) (2006) *WWF Living Planet Report*.
- 3 Ness, E (2007) Are Pollination Services Being Left Bee-Hind? Published on the Ecosystem Marketplace http://ecosystemmarketplace.com/pages/article.news.php?component_id=5109&component_version_id=7516&language_id=12
- 4 Birdlife International (2004) *State of the World's Birds 2004. Indicators for our changing world*. Cambridge, UK. Birdlife International.
- 5 This figure is derived from a major study undertaken by a group of leading biologists and environmental economists which was published in 2002 (Balmford *et al op cit*) and which reviewed over 300 case studies covering a range of ecosystems globally. In all cases the loss of non- marketed environmental services (such as water supply and flood protection) outweighed the marketed marginal benefits of conversion of habitats to other uses.
- 6 The Stern report (2007) *The Stern Review of the Economics of Climate Change*.
- 7 The Stern report *ibid*.
- 8 Schuyt, K. & Brander, L. (2004) *Living Waters Conserving the Source of Life - The Economic Values of the World's Wetlands*. WWF-International, Gland, Switzerland.
- 9 As stated in decision VI/26 of the Conference of the Parties to the Convention on Biological Diversity. In its mission statement, Parties committed themselves to a more effective and coherent implementation of the three objectives of the Convention, and specifically to achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on earth.
- 10 Business and Ecosystems (2007). *Issue Brief: Ecosystem Challenges and Business Implications*. Earthwatch Institute, IUCN, World Business Council for Sustainable Development and World Resources Institute.
- 11 For example Insight Investment and F & C Asset Management (see <http://www.businessandbiodiversity.org/pdf/FC%20Biodiversity%20Report%20FINAL.pdf>).
- 12 For example the analytical work that has been produced in 2007 by Goldman Sachs (GS Sustain), as well as IFC (Taking Stock – Adding Sustainability Variables to Asian Sectoral Analysis).
- 13 U.S. PIRG, (2006) *Saving the Arctic in the boardroom* (<https://www.uspirg.org/issues/americas-wild-places/arctic-national-wildlife-refuge/saving-the-arctic-in-the-boardroom>).
- 14 The Dow Jones Sustainability Index considers biodiversity and ecosystem services in its evaluation of companies in the following sectors: aluminum, real estate, mining, building materials, transport, water, travel and tourism, pipelines, oil, gas and coal companies, gas and utilities. The consideration includes whether companies have in place policies or structures to assess and mitigate biodiversity-related risks.
- 15 Nellemann, C. Miles, L, Kaltenborn, B. P. Virtue, M., and Ahlenius, H. (Eds) (2007). *The last stand of the orangutan – State of emergency: Illegal logging, fire and palm oil in Indonesia's national parks*. United Nations Environment Programme.
- 16 Nellemann, C *et al. ibid*
- 17 Hooijer, A., Silvius, M., Wösten, H. and Page, S. (2006) PEAT-CO2, Assessment of CO2 emissions from drained peat lands in SE Asia. Delft Hydraulics report Q3943.
- 18 See <http://www.unep-wcmc.org/> and <http://www.gbif.org/>
- 19 For example forest products are subject to international production and trading standards such as the Forest Stewardship Council (FSC), Program for the Endorsement of Forest Certification (PEFC) and similar certification led systems seem likely to emerge from soy, palm oil, and sugar cane. Attempts to certify minerals (diamonds and metals) and hydropower are also evident.
- 20 F&C Asset Management (2004) *Is biodiversity a material risk for companies? An assessment of the exposure of FTSE sectors to biodiversity risk*.
- 21 For example see F&C Asset Management Ltd (2003) *New risks in old supply chains: Where does your palm oil come from? From lipstick to ice cream: a survey of palm oil use and supply chain management*. F&C Asset Management Ltd. (2004) *Is biodiversity a material risk for companies? An assessment of the exposure of FTSE companies to biodiversity risk*. (<http://www.businessandbiodiversity.org/pdf/FC%20Biodiversity%20Report%20FINAL.pdf>) and F&C Asset Management Ltd. (2004) *Are extractive companies compatible with Biodiversity? Extractive Industries and Biodiversity: A Survey*. Foxall, J, Grigg, A, ten Kate, K. (2006) *Protecting Shareholder and Natural Value. 2005 Benchmark of Biodiversity Management Practices in the Extractive Industry*. Fauna & Flora International & Insight Investment.
- 22 <http://www.equator-principles.com/> Equator adopters undertake to apply the International Financial Corporation's Performance Standards to certain types of project financing. These Standards include specific expectations and requirements in relation to both biodiversity and ecosystem services.
- 23 These criteria were used by Insight Investment and FFI in the report: *Protecting Shareholder and Natural Value: 2005 Benchmark of Biodiversity Management Practices in the Extractive Industry*.
- 24 Enhanced Analytics Initiative is an international collaboration between asset owners and managers aimed at encouraging brokerages to produce better investment research, in particular research that take account of the impact of extra-financial issues on long-term investment. The initiative encourages sell-side analysts to cover environmental, social and governance issues by allocating five percent of their broker commissions for such research. The Initiative currently represents total assets under management of c. €1.8 trillion (c. US\$2.4 trillion).
- 25 World Bank (2007) *At Loggerheads? Agricultural Expansion, Poverty Reduction and Environment in the Tropical Forests*.
- 26 Pembina Institute (2005) *Counting Canada's Natural Capital: Assessing the Real Value of Canada's Boreal Ecosystems*.

- 27 Bishop, J. Kapila, S. Hicks. F and Mitchell, P. (2006) Building biodiversity business: Report of a scoping study. Draft for Discussion. IUCN.
- 28 <http://www.ecosystemmarketplace.com/>.
- 29 <http://carbonfinance.org/Router.cfm?Page=FCPF&FID=34267&ItemID=34267>
- 30 Earthwatch Institute, IUCN, WBCSD and WRI (2006) *Business and Ecosystems (2006)* and Mulder I (2007) *Biodiversity - the next challenge for financial institutions?* IUCN.
- 31 See for example the requirements that are emerging under the Renewable Fuel Transport Obligation (RTFO) "The UK Government is committed to encouraging biofuels that deliver real carbon savings and do not cause environmental damage. The Government believes this can be achieved by requiring transport fuel suppliers to report on the carbon saving and sustainability of the biofuels for which certificates are issued under the RTFO. (<http://www.dft.gov.uk/consultations/open/rtforeporting/>)
- 32 Jean-Marie Frenzt (2006) *Scoping Study to Assist in Structuring of a Biodiversity Financing Technical Assistance Facility*. EBRD <http://www.ebrd.com/enviro/tools/biodiv.pdf>
- 33 http://www.efmd.org/html/Projects/cont_detail.asp?id=051202bysd&aid=051202ljd&tid=1&ref=ind
- 34 Luiz Maia (2007), *The role of financial institutions and sustainability*, UNEP FI Working Capital Report <http://www.unepfi.org/fileadmin/documents/WorkingCapital.pdf>
- 35 http://www.unepfi.org/fileadmin/documents/unlocking_value.pdf
- 36 For example the CEO briefings on *Finance for Carbon Solutions and the Climate risk to the Global Economy report*.
- 37 For example, CitiGroup's commitment of \$50 billion and the Bank of America's commitment of \$ 20 billion both of which have been made in 2007 and which are designed to service mainstream investment opportunities that reduce or mitigate climate change. In June 2007 Credit Suisse also announced it would make a strategic investment of €4 million in carbon credit aggregator Ecoscurities, and the two companies aim to raise up to €100 million "in pursuit of new carbon market opportunities".
- 38 European Space Agency. (2007) http://www.esa.int/esaEO/SEMOKCC4VUE_environment_2.html
- 39 Perrot-Maitre (2006) *The Vittel payments for ecosystem services: A "perfect" PES case?* International Institute for Environment and Development.
- 40 Lambe, G. The Banker (January 2007)
- 41 Fox, J (2006) The value of your eco-assets. Electric Perspectives
- 42 ten Kate, K., Bishop, J., and Bayon, R. (2004). *Biodiversity offsets: Views, experience, and the business case*. IUCN, Gland, Switzerland and Cambridge, UK and Insight Investment, London, UK.
- 43 Fox, J (2006) op cit
- 44 Lambe, G. The Banker (January 2007)
- 45 <http://www.naturalcapitalproject.org/about.html>
- 46 http://www.unepfi.org/work_streams/biodiversity/index.html
- 47 <http://www.fauna-flora.org/newsnvi2.php>
- 48 Biofuels and biodiversity are variously addressed via the Roundtable on Sustainable Palm Oil, Better Sugar-cane Initiative and Round Table for Responsible Soy)
More general analysis of the effects on biodiversity from agribusiness is summarized in Clay, J. (2004), *World Agriculture and the Environment – A Commodity by Commodity Guide to Impacts and Practices*. Island Press.
- 49 Guidance on the environmental impacts of cement production (including biodiversity) is provided at www.wbcsdcement.org/ More general guidance on the utility sector and biodiversity is provided in Biodiversity: Towards Best Practice for Extractive and Utility Companies http://www.wbcsdcement.org/pdf/tf5/biodiversity_consultation_document.pdf. (2003).
- 50 *Ibid.*
- 51 <http://www.fao.org/biodiversity/index.asp>.
- 52 A general review of forestry and biodiversity issues and trends can be found at http://countdown2010.net/archive/forests_biodiversity.html, and also at <http://www.forest-trends.org/index.php>
Excellent guidance on sustainable forest management is provided in Higman S., Mayers J., Bass S., Judd N., and Nussbaum R (2005) *The Sustainable Forestry Handbook* 2nd Edition. Earthscan.
- 53 International Tourism Partnership and Conservation International (2005) *Sustainable Hotel Siting, Design and Construction Guidelines* (<http://www.tourismpartnership.org/>).
- 54 International Council on Mining and Metals (2006) *Good Practice Guidance for Mining and Biodiversity* (<http://www.icmm.com/>).
- 55 World Resource Institute (2003) *Mining and Critical Ecosystems: Mapping the Risks*.
- 56 For example see Citigroup (2006) *Towards sustainable mining report (Riding with the Cowboys or Hanging with the Sheriff)*.
- 57 The Energy and Biodiversity Initiative (2003) *Integrating Biodiversity Conservation into Oil and Gas Development* (<http://www.theebi.org/>). The International Petroleum Industry Environmental Conservation Association (IPIECA) (<http://www.iecea.org/index.php>) has also produced a range of good practice materials on biodiversity and the oil and gas sector.
- 58 Further details and guidance on hydropower, biodiversity and ecosystem services can be found at the International Hydropower Association (http://www.hydropower.org/publications/leaflets_and_factsheets.html) and also the World Water Council (<http://www.worldwatercouncil.org/index.php?id=21>).

Participating Institutions

About the UNEP Finance Initiative (UNEP FI)

The United Nations Environment Programme Finance Initiative (UNEP FI) is a global partnership between the United Nations Environment Programme and the private financial sector. UNEP FI works closely with the 170 financial institutions that are Signatories to the UNEP FI Statements, and a range of partner organisations, to develop and promote linkages between the environment, sustainability and financial performance. Through regional activities, a comprehensive work programme, training activities and research, UNEP FI carries out its mission to identify, promote, and realise the adoption of best environmental and sustainability practice at all levels of financial institution operations.

About the Biodiversity & Ecosystem Services Work Stream (BESW)

The Biodiversity & Ecosystem Services Work stream (BESW) is based on the need to engage the financial services sector in identifying and addressing the challenges arising from the loss of biodiversity and the degradation of ecosystem services.

The development of UNEP FI's work on this issue comes partly as a response to the UN Convention on Biological Diversity (CBD) CoP 8 decisions on private sector engagement which states that parties: "Invites businesses and relevant organizations and partnerships, such as the Finance Initiative of the United Nations Environment Programme, to develop and promote the business case for biodiversity....."

The BESW consists of the following members:

Richard Burrett	ABN AMRO (Chair)
Nicolas Boquet	Association Française pour Entreprises Privées
Emma Stewart	Business for Social Responsibility
Courtney Lowrence	Citigroup
Nicolas Bertrand	Convention on Biological Diversity
Elsa Kruger-Cloete	Development Bank of South Africa
Robert Barrington	F&C Asset Management
Annelisa Grigg	Fauna and Flora International
Kerry Ten Kate	Forest Trends
Nalini Naidoo	Industrial Development Corporation of South Africa
Rachel Crossley	Insight Investment
Mike Kelly	KMPG
Justin Smith	Nedbank
Sayaka Kobayashi	Nikko Asset Management
Bart Jan Krouwel	Rabobank Netherlands
Dave Richards	Rio Tinto
Nelson Switzer	Royal Bank of Canada
Sybille Borner	Sustainable Asset Management (SAM) Group
Alice Ruhweza	The Katoomba Group
Jon Hutton	UNEP - World Conservation Monitoring Centre
Sharon Maharg	West LB
Martin Hancock	Westpac Banking Corporation
Cecilia Repinski	World Resources Institute

Contact Details: biodiversity@unepfi.org • www.unepfi.org/biodiversity

Acknowledgements

Project Team at the United Nations Environment Programme Finance Initiative (UNEP FI)

Head of Unit Paul-Clements Hunt
Project Lead Susan Steinhagen

Project Team at Sustainable Finance Limited

Director Andre Abadie
Project Lead Mark Eckstein
Project Team Yulanda Chung

Project Team at Fauna & Flora International

CEO Mark Rose
Project Lead Annelisa Grigg
Project Team Dr Barney Dickinson, Dr Abigail Entwistle, Ros Aveling

Special Thanks

We acknowledge the valuable contributions of

Nicholas Bertrand, Convention on Biological Diversity
Richard Burrett, ABN AMRO
Sharon Maharg, WestLB
Nalini Naidoo Industrial Development Corporation of South Africa
Cecilia Repinski, World Resources Institute
Justin Smith, Nedbank
Emma Stewart, Business for Social Responsibility
Nelson Switzer, Royal Bank of Canada

The information contained in the report is meant for informational purposes only and is subject to change without notice. The content of the report is provided with the understanding that the authors and publishers are not herein engaged to render advice on legal, economic, or other professional issues and services. Subsequently, UNEP FI is also not responsible for the content of web sites and information resources that may be referenced in the report. The access provided to these sites does not constitute an endorsement by UNEP FI of the sponsors of the sites or the information contained therein. Unless expressly stated otherwise, the opinions, findings, interpretations and conclusions expressed in the report are those of the various contributors to the report and do not necessarily represent the views of UNEP FI or the member institutions of the UNEP FI partnership, UNEP, the United Nations or its Member States.

While we have made every attempt to ensure that the information contained in the report has been obtained from reliable and up-to-date sources, the changing nature of statistics, laws, rules and regulations may result in delays, omissions or inaccuracies in information contained in this report. As such, UNEP FI makes no representations as to the accuracy or any other aspect of information contained in this report.

UNEP FI is not responsible for any errors or omissions, or for any decision made or action taken based on information contained in this report or for any consequential, special or similar damages, even if advised of the possibility of such damages.

All information in this report is provided 'as is', with no guarantee of completeness, accuracy, timeliness or of the results obtained from the use of this information, and without warranty of any kind, expressed or implied, including, but not limited to warranties of performance, merchantability and fitness for a particular purpose. The information and opinions contained in the report are provided without any warranty of any kind, either expressed or implied.

Published in 2008 by UNEP FI

Copyright © UNEP FI

The report and the content of the report remain the sole property of UNEP FI. None of the information contained and provided in the report may be modified, reproduced, distributed, disseminated, sold, published, broadcast or circulated, in whole or in part, in any form or by any means, electronic or mechanical, including photocopying, or the use of any information storage and retrieval system, without the express written permission from the UNEP FI Secretariat based in Geneva, Switzerland. The content of the report, including but not limited to the text, photographs, graphics, illustrations and artwork, names, logos, trademarks and service marks, remain the property of UNEP FI or its affiliates or contributors or partners and are protected by copyright, trademark and other laws.

UNEP Finance Initiative

International Environment House
15, Chemin des Anémones
1219 Châtelaine, Genève
Switzerland

Tel: (41) 22 917 8178 Fax: (41) 22 796 9240

fi@unep.ch

www.unepfi.org