

25 July 2005

Biodiversity Offsets – A Briefing Paper for the Mining Industry

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1. Executive summary

Industry faces challenges as a result of its social, economic and environmental footprint. Since the mid 1990s, the mining industry has engaged in dialogue with environmental and social development organisations to determine how to address these challenges. Through this dialogue biodiversity has been identified as a key business and environmental issue. ICMM member companies are committed to high standards of on-site mitigation as outlined in the recent ICMM Good Practice Guidance (ICMM 2005). However, they recognise that mining activities may have a residual impact on biodiversity which cannot easily be mitigated or which lie outside the direct control and responsibility of the mining company. Biodiversity offsets offer a potential mechanism of compensating for these impacts that may offer benefits to both biodiversity and business. In a joint IUCN-ICMM workshop held in 2003 participants agreed to explore the use of biodiversity offsets (box 1) in recognition that there may be a point at which investment in biodiversity offsets provides greater social, environmental and economic benefits than trying to mitigate all impacts (IUCN and ICMM 2003).

Box 1: What are biodiversity offsets?

Sustainable conservation actions intended to compensate for the residual, unavoidable harm to biodiversity caused by development projects, so as to aspire to no net loss in biodiversity. Before developers contemplate offsets, they should have first sought to avoid and minimise harm to biodiversity. (After ten Kate, Bishop & Bayon 2004).

Why create biodiversity offsets?

Biodiversity offsets are already part of the legal framework in some countries (USA, Brazil, Europe, Switzerland and Canada). However, companies, such as Newmont and Rio Tinto are participating in voluntary offsets, suggesting that there is a business case beyond legislative compliance. There is a significant overlap between active mining and exploratory sites and areas of high conservation value (WRI 2003). Despite best efforts to mitigate all impacts on biodiversity from developments, residual impacts may still remain. Offsets could offer a means of ensuring continued access to resources, securing licence to operate and (given the increasing interest from investors in offsets for risk management purposes) continued access to finance. For governments, biodiversity offsets may help to ensure that commitments such as those under the Millennium Development Goals and the Convention on Biological Diversity are met. For environmental groups offsets can potentially achieve greater conservation value for money. If designed appropriately, they may also confer livelihood and health benefits.

Areas of uncertainty

A number of areas of uncertainty exist that are hampering the uptake of offsets:

- Measuring impacts and establish appropriate baselines that include background biodiversity change
- How to devise appropriate offsets that are acceptable and link to business impacts on biodiversity ensuring comparability and the use of a common currency
- Issues of time, scale and equity i.e. when to deliver offsets in a project cycle, how far away from the project to devise them, and equitable distribution of the associated costs and benefits
- Who to involve in decisions on offsets, who ultimately decides and what role government plays
- How to ensure offsets are appropriately managed and are financially and ecologically sustainable

Nonetheless, a number of areas of general agreement are developing, such as the need to involve stakeholders throughout the process of offset identification and design in order to aid transparency, credibility, good governance and delivery. It is thought that decision making will need to be flexible to allow adjustment for a changing social, environment and economic operating environment. At the same time, a robust baseline will need to be set against which the offset's delivery against stated objectives can be assessed. Some feel that external verification may be required to evaluate the attainment of such objectives to ensure the offset is viewed as credible (WA EPA 2002). Biodiversity offsets also need to be designed to be sustainable in financial, management and legal terms (NSW 2002).

Link to the ICMM proposition

There are a number of uncertainties about offsets which require debate and agreement amongst a range of stakeholders. This paper and the associated ICMM proposition on offsets (ICMM 2005) are put forward to stimulate this debate in order to reach broad agreement on if, how and where biodiversity offsets could be used to address development impacts on biodiversity.

2. Introduction

Where careful consideration of the social, cultural, economic and environmental impacts and benefits of a project indicates that development should proceed, biodiversity offsets have been identified as a potential means of addressing impacts on biodiversity that cannot be avoided, minimised or mitigated as outlined in the ICMM Good Practice Guidance (ICMM 2005). First formalised in the USA system of wetlands mitigation in the 1970s, biodiversity offsets are receiving increasing attention from environmental groups, a range of industries (including mining, construction, oil and gas and forestry), government and investors as a means of helping to balance competing demands of development and conservation protection. Some environmental groups see them as way of securing more and better conservation, for companies they are a means of securing and maintaining licence to operate and investors as a mechanism to help minimise the risks associated with corporate impacts on biodiversity.

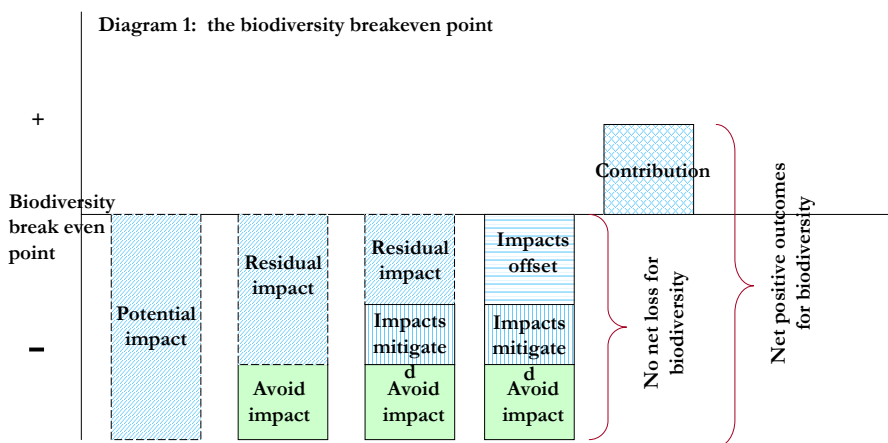
This paper is intended as a briefing document that highlights the key components of the current debate on biodiversity offsets. It draws heavily from the more detailed discussions of offsets set out in a paper from IUCN and Insight Investment (ten Kate *et al.* 2004). In it, ICMM puts forward a working definition for biodiversity offsets (section 3), considers the business case for offsets (section 4), highlights issues relating to the design of biodiversity offsets (sections 5), outlines the parties that have a stake in the decision on offsets (section 6), considers the management needs related to offsets (section 7) and offers a proposition from ICMM relating to offsets (section 8).

3. What is a biodiversity offset?

In this section the industry’s contribution to biodiversity and biodiversity offset are defined and the way in which offsets fit in with overall corporate strategy commitments is considered.

3.1 The biodiversity breakeven point

The impacts of the mining industry on biodiversity can be classified as primary (resulting directly from project activities, and typically limited to the immediate project area), or secondary (indirect impacts triggered by the project’s presence e.g. inward migration). They can be avoided by the design or location



of operations or mitigated where they cannot be avoided. Where impacts can be neither avoided or mitigated, they can potentially be offset by investing in conservation activities based either within a mining concession or outside it.

Thus, biodiversity offsets can potentially be used to compensate for residual impacts on biodiversity, which cannot be mitigated on-site. They are considered a last option in a comprehensive biodiversity management response, where the first is to avoid impacts

on biodiversity (Diagram 1). The balance between impacts and offsets is the “biodiversity breakeven point” i.e. the point where there is no net loss of biodiversity. It is an ongoing challenge to agree where and when the breakeven point occurs and this point will differ according to location, time and the perception of the person/ party impacted on or by the development.

3.2 Contributing to conservation

Some stakeholders are asking for investment from companies in activities that give rise to conservation benefits. They see these as going beyond compensating for the residual impacts of operations to providing a positive contribution to biodiversity conservation. Such activities potentially allow the company to exceed the biodiversity breakeven point and can be used to help it move toward a position of net positive impact on biodiversity. These contributions may also occur where the company impact on biodiversity is negligible but where the company undertakes activities on site that result in a significant increase in ecological value of the land where previously it was degraded. Alternatively, a contribution could be made through investment in research, education or capacity building of conservation infrastructure.

Demonstrating that a company has a positive or neutral impact on biodiversity through summing contribution and mitigation is difficult, however, a number of companies, in different sectors, are now signing up to commitments to ‘no net loss’ to biodiversity or ‘net positive effect on biodiversity’ (see 3.4).

3.3 Biodiversity offsets and definitions

There are a number of different definitions for the term ‘biodiversity offsets’. The Western Australia Environmental Protection Authority, for example, defines offsets as “Environmentally beneficial activities undertaken to counterbalance an adverse environmental impact, aspiring to achieve ‘no net environmental loss’ or a ‘net environmental benefit’.” (WA EPA 2004). Similarly, the Energy and Biodiversity Initiative defines offsets as “a form of mitigation used to address net biodiversity loss after all other mitigation measures have been taken”(EBI 2003a). Biodiversity offsets are currently used in reference to both like-for-like exchange for land, and activities such as funding of biodiversity research, provision of financing for protected areas or support for capacity building in government agencies. There is considerable debate on whether both types of activities should constitute an offset which is revisited in section 5.

In this paper we have used the definition of offsets set out in Box 2. It begins with the term “sustainable”: recognizing the need for the lifespan of an offset to at least match the duration of the impact. The definition allows the offsetting of both primary and secondary impacts, but does not limit biodiversity offsets to like-for-like exchange of land.

Box 2: Defining a biodiversity offset

Sustainable “conservation actions intended to compensate for the residual, unavoidable harm to biodiversity caused by development projects, so as to aspire to no net loss in biodiversity. Before developers contemplate offsets, they should have first sought to avoid and minimise harm to biodiversity.” (After ten Kate, Bishop & Bayon 2004)).

3.4 The link to corporate strategies

In a recent publication of case studies on biodiversity management, ICMM, highlighted the use of offsets in the mitigation of residual impacts as a key component of impact assessment (ICMM 2004). In fact, companies are already exploring the use of biodiversity offsets as part of their overall approach to avoiding loss of biodiversity and through this protecting their licence to operate. The Iron Ore Company of Canada, for example, as part of an agreement under new Federal regulations to confine and rehabilitate its iron ore tailings at its Labrador City mine, agreed to a fish habitat compensation agreement with Fisheries and Oceans Canada (IOC 2004). Similarly, BHPBilliton purchased a 650 hectare

block adjacent to the Ravensthorpe Nickel Project which is located within the buffer zone of the Fitzgerald River Biosphere to compensate for loss of habitat from mining (BHP Billiton 2004).

Such activities may be framed within a wider policy commitment as a key part of the overall environmental and social strategy of a company. BHP Billiton, for example, has committed to 'zero environmental harm' in its environmental policy, while Rio Tinto aims to have a 'net positive benefit to biodiversity'. Rio Tinto identifies biodiversity offsets as one of the possible means, alongside a range of other mechanisms that can be used to achieve net positive benefit to biodiversity.

Other sectors, such as the oil and gas sector, are also exploring the use of offsets (EBI 2003a; IPIECA 2003). This reflects the increasing recognition of links between maintaining healthy ecosystems and sustainable development (EBI 2003a), retention of license to operate and continued access to resources (Goldman Sachs 2004).

4. Why develop biodiversity offsets?

This section outlines the factors prompting the current interest in offsetting biodiversity impacts: mandatory and voluntary.

4.1 Legal requirements for biodiversity offsets

Increasingly, legislation in a number of countries requires compensatory measures for land use and impacts. In countries such as Brazil, USA, Switzerland, Canada, and the European Union, biodiversity offsets are part of the legal compliance framework (see Appendix 1). A number of other countries are considering whether offsets might form a useful component of their biodiversity management programme. Some companies are therefore developing experience of developing offsets within existing regulatory frameworks. In practice, such legislation may not always be effectively implemented (Box 3). The experience from the USA which has one of the longest standing biodiversity offset schemes has resulted differing views as to whether it has truly resulted in an overall biodiversity gain.

Box 3: Wetland Banking in the USA

Perhaps the longest standing example of the use of biodiversity offsets is the USA's Wetland Banking system. This requires companies to take steps to avoid, and minimise, damage to wetlands before considering offsets. A study by the Tennessee Technological University showed that wetland mitigation schemes in Tennessee had resulted in a greater area of wetlands. However, they were unable to draw conclusions as to whether the function of the wetlands remained as robust as natural wetlands (Morgan and Roberts 1999). A wetlands policy review by the Florida Government highlighted a similar issue in 2000, recommending the development of a methodology for evaluating functionality of wetlands and expressing concern that policy commitments to no net loss might be met in terms of area of land mitigated, but not in wetland function.

In a number of other countries, the legislative regime or local government policies are encouraging the uptake of biodiversity offsets. In Australia, in particular, a range of state level schemes are developing in Western Australia, Victoria and New South Wales which link environmental offsets into State sustainable development strategies (Appendix 2) and are encouraging the use of biodiversity offsets as part of a company's development requirements.

4.2 The business case for voluntary offsets

The mining industry has a number of unique characteristics which creates a business case for undertaking voluntary biodiversity offset programmes. These include:

- **Access to land:** Mining can only take place in locations with viable ore bodies. The occurrence and exploitation of these is increasingly located in biodiverse regions (World Resources Institute 2003). At

the same time, mining processes disturb land and thus there will always be some unavoidable impacts on biodiversity. However, continuing access to new land – with associated potential disturbance of biodiversity - is essential if the demand for minerals is to continue to be met. Although legislative frameworks in some places require the use of biodiversity offsets, in others the nature of the industry itself means that the industry has a particularly strong interest in the potential use of biodiversity offsets. This interest is linked to concerns about gaining access to land, capital and creating strong relationships with local communities and employees

- **Distinctive market position/ competitive advantage** as a result of improved relations with governments, communities and employees; ability to anticipate and respond to new legislation on offsets (ten Kate, Bishop & Bayon 2004)
- **Cost-effectiveness:** The costs of rehabilitating a mine site are typically higher than restoring it to a healthy, but different, functioning ecosystem. In the Australian Bowen basin, for example, the costs of fully rehabilitating one hectare of mine site were found to be equivalent to buying 200-400 hectares of untouched woodland in the same area (Rolfe 2001). It may, therefore, be preferable to use a portion rehabilitation funding to support restoration and conservation activities in another similar habitat, or to conserve different land of much higher conservation priority
- **License to operate:** Offset schemes can be part of maintaining licence to operate and access to land that might otherwise have been unavailable to the company; for example, Alcoa's investment in biodiversity management activities at Jarrah forest mines in Australia is made in part to help ensure they retain the right to lease land for mining. This is made alongside compensation payments to the government linked to concession rights
- **Access to capital:** Partly as a result of external pressure, the finance sector is becoming increasingly concerned with environmental and social management. Twenty nine major financial institutions operate the Equator Principles, committing them to applying IFC's safeguard policies - including using offsets as a means of mitigating project impacts - in investment projects exceeding \$50 million (<http://www.equator-principles.com/>). This includes finance to the mineral sector
- **Ethical environmental stewardship:** Through ICMM's sustainable development principles, ICMM members commit to both contribute to the conservation of biodiversity and to the social, economic and institutional development of the communities in which they operate. They also commit to integrate sustainable development considerations within their corporate decision-making process. This commitment requires economic benefits to be balanced with equity and environmental protection. Offsets provide companies with an opportunity to achieve optimal environmental, economic and social outcomes at a community or landscape scale

There are also a number of risks to developing biodiversity offsets:

- **Conservation concerns:** risks associated with the perception that biodiversity offsets give a licence to develop where development is viewed by some stakeholders as unacceptable, and that lack of coordination may result in an overall loss of biodiversity
- **Reputational risks:** concerns linked to engaging on an emerging issue that is seen as contentious
- **Changing perceptions:** the longevity of a mine, and offset, may lead to changes in perception of mitigation/ compensation activities
- **Valuation issues:** risks of being criticised for not representing all interests in the design of an offset, lack of ability to demonstrate positive impacts on biodiversity through lack of established and agreed measurement procedures

- **Costs and liabilities:** difficulties in identifying, managing and funding appropriate offsets, concerns over the costs of development of offsets, concerns about legal liability for offset areas in perpetuity, and fears of developing activities which rely on skills that lie outside the company's core skill set

Clear, enforced, legislative systems that address these concerns, and ensure corporate governance and compliance with (and enforcement of legislation) for environmental protection are not yet in place in all countries. This may hamper the uptake of offsets. Indeed, some stakeholders believe legislation may be a pre-requisite for successful offset programmes (ten Kate, Bishop & Bayon 2004).

5. Currency and design

This section examines the range of issues that need to be considered when designing a credible biodiversity offset.

5.1 Understanding biodiversity value

There are few broadly agreed quantitative methodologies that assess and quantify both the total biodiversity impacts of a company's operations, and the biodiversity benefits of proposed offsets (ten Kate, Bishop & Bayon 2004). Unlike carbon credits, which are based on the common unit of carbon equivalents, biodiversity values are much more complex to measure, especially ecosystem service roles (Salzman & Ruhl 2002). These values are needed to compare the 'no offset' and 'no development' options with costs of 'normal' operations. Variables such as disruption of evolutionary processes and moral, cultural and subsistence use values (Bøhn & Amundsen 2004) and their impact on biodiversity values makes the situation extremely complex. Without a common currency, it is difficult to ensure that like is exchanged for like (or an acceptable equivalent), to identify the potential costs and benefits of using offsets.

A priority is to ensure that the offset is designed so it provides 'new and additional' conservation. In other words it must provide some benefit to conservation that would not otherwise have occurred. However, there are arguments that suggest that channelling resource into new conservation activities may not in fact be the most effective use of resources and that more conservation benefit may be derived from providing resources to existing but currently underfunded conservation activities. Where data are absent, a combination of the precautionary principle, ecological valuation and economic valuation may help. In both ecological and economic valuations, a strong subjective element and degree of estimation is involved, complicated by the need to place any evaluation within a wider context of social, environmental and economic change.

5.2 Ecological valuation

Ecological valuation is one method for measuring the biodiversity value of an offset. It assesses land based on habitat value. Some of the approaches used in a range of legislative environments are given in Appendix 1. To date there has been a tendency to focus on like-for-like land swaps due to the difficulties experienced in developing accurate and cost effective measurements of baseline biodiversity. Such offsets are often designed to be larger than the area of land taken for development (ten Kate 2003); assuming this approach will help mitigate biologically important issues such as fragmentation, edge effects, and isolation from formerly continuous blocks of similar habitat. In Mexico, for example, the proportionate size of offsets increases the further the offset is away from the impacted area. In New South Wales, the ratio of offset to impacted area is set as proportional to the ecological value of the area being impacted and the likelihood of the offset's success. An alternative is a method used by the Australian state of Victoria, which uses an environmental benefit index based on salinity, land-use change, size of area, and management actions to provide a score to evaluate different projects (Natural Heritage Trust n.d.). Like other methods, this focuses at the site-specific level, however, to be effective, offset sites need to be placed within regional and national decisions-making contexts. In areas of uncertainty the precautionary principle is used (WA EPA 2004).

5.3 Economic valuation

The use of economic valuation of goods and services derived from biodiversity is increasingly common practice. This technique may be applicable to the valuation of activities and areas of land for biodiversity offsets. It is based on the identification and valuation of the benefits arising from and costs of utilising ecological services (water, timber, food etc). Such techniques may be applicable to compensatory activities which do not involve a like for like exchange of land such as the building of local capacity to deliver the country's commitments to the CBD (Hollands & Richards 2003). Economic valuation values biodiversity based on economic cost models, considering factors such as subsistence use, opportunity costs from development and not developing and the value of ecosystem services.

5.4 When to offset?

As soon as exploration and development starts, stakeholders see impacts and changes in biodiversity. These may subsequently be negligible or reversed, however, the perception by local stakeholders may be of lasting and significant damage. Physical offsets therefore may need to be established before development (ten Kate, Bishop & Bayon 2004) potentially at the time when the company is granted the concession rights, and identification included as part of the outcomes of an Environmental and Social Impact Assessment. Activities like conservation capacity building could be used to demonstrate that the intent is zero harm to biodiversity, as appropriate physical offsets are being developed. Both activities are in place at the Rio Tinto Coal mine site in the Upper Hunter Valley, NSW, which has a set of Habitat Management Areas (HMAs) agreed with regulators and Aboriginal groups. These aim to offset the short to medium term loss of habitat resulting from the mine expansion, and to maintain ecological connectivity in the area until the mine is rehabilitated. (Fish, Snashall & and Streater 2004).

5.5 Local, regional or global offsets?

Offsets could be developed within or near the site of the impact or some distance away from it. Local stakeholders are typically unlikely to be willing to accept an offset remote to the area of impact. As Ian Wood from BHP Billiton stated in ten Kate *et al.* 2004, "So many conservation issues are local that the offset needs to be seen in the local context. People would not be happy if their local protected area was impacted and the conservation benefit was way away in Malaysia." Nor can like-for-like offsets easily address secondary impacts, or a company's potentially cumulative impacts which cannot be directly linked to an individual location. ten Kate *et al.* (2004) suggested that such impacts could be combined and addressed through regional or global level biodiversity offsets which could identified by regional and national Biodiversity Strategies and Action Plans. These could then include contributions to capacity building, research or a physical global conservation priority.

5.6 Principles-based agreement

Until the methods described in 5.1 - 5.5 are fully established, a more principles-based approach may be all that is feasible (Appendix 2). Whilst providing a good starting point, the range of principles outlined in Appendix 2 do not consistently address issues such as inclusive decision making processes, and well designed and clearly communicated implementation and monitoring plans. Nor do they address offsets in perpetuity, or the potential range of scales (local or national, for example) at which offsets should be considered. The former refers to the need to ensure that an offset remains viable for as long as the original impact on biodiversity which stimulated its creation is in place. To ensure credibility, principles-based approaches may need to be established at a regional or national basis to be acceptable to local stakeholders.

6. Reaching agreement on offsets

This section considers the nature and scope of corporate biodiversity offset activity, biodiversity investment, and the importance of dialogue with a range of parties who impact on or are impacted by the industry's activities.

6.1 The importance of stakeholder engagement

Offsets by their nature involve a shift in benefits and costs of the mining industry's activities. It is therefore important to ensure equitable distribution of the costs and benefits of developing and implementing an offset. Consultation with local and international stakeholders is likely to assist in this process. If a robust legal framework is in place, it will provide a starting point for designing an appropriately managed biodiversity offset. However, regardless of whether a legal framework is in place, the range of views and interests in the design of offsets will mean that understanding of stakeholder needs may be the key to ensuring that any offsetting or investment activities are both considered credible and also deliver tangible conservation benefits.

One barrier to attaining consensus is the lack of global, regional or national agreements on conservation priorities between the following stakeholders:

- environment and development NGOs each of whom will have a range of perspectives, involving biodiversity social and developmental issues
- local communities dependent on local resources in areas subject to primary or secondary impacts, or changes in ecosystem services
- indigenous peoples: reliant upon local resources in operational or offset areas
- governments and other interested parties; critically important through their involvement with the Convention on Biological Diversity, national and local governments are likely to be key parties in all decisions, and control planning processes

A number of effective and inclusive ways in which to identify and engage with a cross section of stakeholders have been developed, however, these are not always implemented effectively. The lack of such consensus makes company priority-setting decisions difficult and once made, these decisions are vulnerable to criticism from stakeholders.

6.2 Linking offsets and contributions to other issues

Decisions on the use of offsets require these competing concerns to be balanced. The increasing recognition of the importance of biodiversity and livelihoods indicates the need for the active involvement of indigenous people and other natural resource dependent communities (IIED 2004). Box 4 outlines some of the recent developments which highlight the importance of the involvement of indigenous people in decisions that impact on the natural resources on which they depend.

Box 4: Sensitivity to indigenous peoples' rights

The Extractive Industry Review linked the removal of indigenous and local people from traditional lands to a breakdown of communities and cultural norms and loss of livelihoods (EIR 2003). Furthermore, a report by the UN Centre for Transnational Corporations concluded that "performance was chiefly determined by the quantity and quality of indigenous peoples' participation in decision making" and "the extent to which the laws of the host country gave indigenous peoples the right to withhold consent to development" (UN 1994).

Current and draft international law and norms provide indigenous people with the right to participate in decision making. The UN Sub-Commission on the Promotion and Protection of Human Rights' *Norms on Transnational Corporations* (UN 2003) used by companies and investors alike, states that transnational corporations and other business enterprises shall respect the rights of local communities affected by their activities and the rights of indigenous peoples and communities consistent with international human rights standards). Prior informed consent will therefore be important, not only in decisions as to whether to develop a mining resource or not, but in discussions on designing an appropriate offset and contributions to conservation.

6.3 A potential role for systematic conservation planning?

One solution to the issues of consensus building and competing priorities, is the use of systematic conservation planning to establish broad agreement on conservation priorities at a national, regional or global level, and the formulation of an appropriate industry response. Work in the highly biodiverse South African Succulent Karoo biome offers a useful case study of systematic conservation planning as a means of consensus building (Box 5).

Box 5: Systemic conservation planning – a means of establishing consensus? (Maze, Brownlie & Driver 2004)

The Succulent Karoo Ecosystem Planning (SKEP) initiative aims to generate consensus on the areas of key conservation priority amongst a range of stakeholders and to catalyse action to address them. SKEP used an inclusive consultative and scientific process to identify biodiversity priority areas, in order to develop a 20 year conservation and sustainable land use strategy. NGOs, the private sector (mining, tourism and agriculture), academia, government and local stakeholders were all involved as equal players. The transparency, sound science, and defensibility of the systematic conservation planning approach, led to all stakeholders accepting the conservation assessment.

The SKEP process led to a partnership project between conservation NGOs, Anglo American and local communities. The resulting Bushmanland Conservation Initiative (BCI) aims to establish a multi-owned protected area, with some areas under high protection, others being managed for extensive grazing and a third category being set aside for more intensive development activities, including mining. The process of systematic conservation planning has allowed Anglo American to determine the impacts of the Gamsberg mine on biodiversity, establish appropriate mitigation strategies and provide a clear link to conservation priorities. This creates a potentially sound basis for negotiation on actions the company could take to address their impacts and risks.

7. Management and sustainability

This section considers current approaches to governance, reporting, finance and assurance processes to ensure the sustainability and credibility of offset schemes. These are considered throughout the full operational cycle of the mine, including post closure.

7.1 Governance

In its proposed offset scheme (NSW EPA 2002), the government of New South Wales emphasized open and accountable administration of biodiversity offsets, and stakeholder-composed advisory panels as an important component of the management of offsets. Given the potentially contentious nature of offsets, and the high rate of change around them, the use of such panels may be a credible way to ensure appropriate offsets are identified, managed and maintained. These panels may be needed throughout and beyond the life of the operation and immediate offsetting needs. This raises practical issues of how panels are financed and managed, and by whom.

The New South Wales scheme identified enforceability, through consent conditions, licence conditions, covenants or a contract within a legal framework, as a basic need for effective offsets. In many countries there is no legal framework for redress. Consequently, thought needs to be given to the contractual framework required to ensure that offset commitments are delivered. This is especially important when divestment occurs before the end of the mine's working life - the offset could be overlooked within the sale agreement with a resulting loss to biodiversity and undermining of the credibility of such schemes to help meet corporate commitments such as 'zero environmental harm' or 'no net loss to biodiversity'.

The uncertainties around offsets suggest that there is a risk of their potential failure. Some offset schemes have attempted to address this through devising a form of 'insurance' to back up commitments on biodiversity as a means of providing stakeholders with assurance that the offset will not fail. The New South Wales Fisheries, for example, operates a policy of no net loss for marine developments. They have addressed this by requiring a monetary bond as insurance against the offset action failing, for example up to \$250,000 per hectare for seagrass habitat (NSW EPA 2002).

In addition to underwriting the risk of failure, offsets may require sustainable long-term financing mechanisms that are sufficiently flexible to withstand changes in economic conditions or divestment. The pooling of funds from different companies and organizations to support single, or network of, offsets defined by local and regional priorities has been used in both Australia and the USA (NSW EPA 2002) as a risk mitigation exercise. This has the advantage of spreading the cost of offset development, reducing the risk of its failure and of engaging other parties with an interest or responsibility for offset management and design.

7.2 The boundaries of responsibility

Industry cannot undertake offsets in isolation. Government has a key role in determining whether a development proceeds and what environmental safeguards are required as part of that development. Governments also receive revenues through taxation of the income generated from the development. It is therefore appropriate that government adopts a strong role in the design, delivery and measurement of biodiversity of offsets and, indeed, in some cases it may be more appropriate for the government to do so.

7.3 Ensuring credibility

Existing offset schemes place a high value on monitoring, review and third party certification in order to ensure that they deliver their objectives, and retain or improve ecological value, despite changing socio-economic conditions (NSW EPA 2002). The investment community also views verification as a key element of good practice for the management of social and environmental risks. Initially, assurance mechanisms may appear costly, but these costs could be reduced by integration into existing systems, such as upgraded ISO14001 or the Mining Certification Evaluation Project (Box 6).

Box 6. The Mining Certification Evaluation Project (MCEP) (Walker & Howard 2002 (http://www.minerals.csiro.au/sd/SD_MCEP.htm)).

MCEP brings together groups with interests in, and/or concerns about, the social and environmental issues faced by the mining industry. Its objective is to determine the feasibility of establishing a program of independent, third-party certification to evaluate the environmental and social performance of mine sites. WWF Australia is leading the research project with support from a number of private sector and government institutions including Placer Dome Inc., BHP Billiton, WMC, Newmont, and the Commonwealth Scientific & Industrial Research Organisation.

In order to avoid biodiversity loss, offsets need to be flexible to adapt to changing contexts such as changes in pressures exerted on biodiversity by other industries in the region, increasing local economic development and climate change. Clear governance, financial processes and stakeholder participation are needed to ensure that any flexibility is not seen, or used, as a 'get out clause' by industry that will ultimately allow development with loss in biodiversity. In addition to developing effective management and evaluation systems, communication of the rationale behind offsets, their design and role, and their achievements is also likely to be important. The selection and use of indicators to demonstrate the meeting of objectives is therefore a significant part of ensuring biodiversity offsets are credible. However, challenges remain in determining appropriate ways to measure and report biodiversity benefits.

8. The ICMM proposition on biodiversity offsets

ICMM member companies recognize that mining activities will inevitably have an impact on biodiversity at a site level, even when high standards of on-site mitigation are employed. Biodiversity offsets potentially offer a mechanism of compensating for these impacts that may offer benefits to both biodiversity and business. Such offsets can channel resources into priority conservation activities, ideally near the site of impact, providing a higher conservation benefit and being more cost effective than on-site mitigation alone. They may preserve a similar area of habitat outside of the site of impact, or take a less direct approach (such as building the capacity of local organisations) or, indeed, a combination of approaches.

ICMM and its member companies have an interest in understanding more about the concept of biodiversity offsets and the practicalities of their application. We are seeking opportunities to participate in the active debates being carried out in the conservation community and in governments on the subject of offsets and the issue they raise. We hope that the resolution of these debates will lead to greater clarity and certainty on the nature of offset opportunities and the mechanisms for establishing them. If this is achieved, we believe that a greater use of offsets by leading mining companies will result which may take the form of offsets agreed at the project scale or which may form part of wider policy commitments to 'No Net Loss'. The areas which we believe require further debate are set out in a separate paper from ICMM "Biodiversity offsets: a proposition paper from The International Council on Mining and Metals".

Acknowledgements

This paper draws strongly from the recent offsets paper produced by asset manager Insight Investment and IUCN launched at the World Conservation Forum, Bangkok in 2004 (ten Kate *et al.* 2004) and was prepared by Fauna & Flora International in conjunction with the IUCN-ICMM Advisory Group.

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Appendix 1: Examples of offset related legislation (ten Kate, Bishop and Bayon 2004)

Legislation	Additional criteria
<p>Brazil <i>Brazilian Forest Code of 1965 (Law 4771)</i></p>	
<p>At least 20% of native vegetation on property greater than 50 hectares in the eastern, central-west and southern regions is required to be set aside and preserved as a Legal Forest Reserve. The developer can elect to purchase land as an offset if they do not wish to set aside a region in their existing land. Where this land is outside the original water basin or microregion, the figure is increased to 30%. In primitive forests, 80% of natural vegetation must be preserved.</p>	<p>The legal reserve cannot include areas considered permanently preserved nor areas already set aside as conservation units. In other words, they must be additional, the vegetation preserved must be representative of the area and the establishment of vegetation corridors must be considered.</p>
<p>Brazil <i>National System of Conservation Units (SNUC)</i></p>	
<p>Where a development has a significant environmental impact, it must compensate for this by supporting a unit within a National System of Conservation Units (SNUC).</p>	<p>The sum paid depends on the degree of environmental impact of the project. It must be at least 0.5% the total investment costs and in rainforest areas may be above 6%.</p>
<p>Canada <i>Fisheries Act under R.S.1985, c, F-14 policy for Management of Fish Habitat (1986) and the Habitat Conservation and Protection Guidelines, Second Edition (1998)</i></p>	
<p>Based on a principle of no net loss, Canada has developed guidelines that act to preserve species and habitat whilst allowing development. Developers are encouraged to relocate their activities, redesign them, mitigate where relocation and redesign is not possible and compensate for unmitigated damage.</p>	<p>Compensation options include:</p> <ul style="list-style-type: none"> • Creation of similar habitat near to the development area within the same or a different ecological unit that supports the same species • Increasing the productive capacity of the existing habitat at or near the development site or within the same ecological unit or a different one with the same species • Increase the productive capacity of existing habitat for a different stock or species on or offsite
<p>Europe <i>Habitats and Birds Directives and implementing regulations under Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and wild fauna and flora and Council Directive 79/409/EC, Environmental Liability Directive 04/04</i></p>	
<p>If a developer intends to undertake an activity in or near a Natura 2000 site, it must demonstrate that the project does not, either alone or cumulatively with other projects, impact on the Natura 2000 site. The developer must demonstrate that it will offset any damage caused to the Natura 2000 site by positive conservation measures taken elsewhere within the site. If the project cannot be changed or mitigation activities cannot be adopted on site and it must progress for 'imperative reasons of overriding public interest', the Habitats Directive</p>	<p>No set criteria, but offsets must ensure that the overall coherence of the Natura 2000 network is protected. By inference this suggests that like-for-like exchange of habitat or a near alternative will be preferred.</p> <p>The Environmental Liability Directive makes specific reference to biodiversity and operates on the 'polluter pays principle' requiring companies to undertake compensation for environmental damage or imminent environmental damage. The</p>

Legislation	Additional criteria
allows for offsite offsets.	form of this compensation is not yet set and the Directive comes into force in 2007.
USA <i>Wetland Banking under the Clean Water Act 1972 and the US Army Corps of Engineers regulations</i>	
<p>Developers whose activities potentially damage wetlands must seek permits from the US Army corps. They must prove that damage to wetlands is unavoidable, seek to minimise adverse impacts that cannot be avoided and, where unavoidable adverse impacts remain, they must provide compensatory mitigation (offset the damage). Developers can either buy wetlands credits, undertake the mitigation activities themselves or employ a third party to do so. In designing these offsets, the wetlands must be of similar function and value in a specified service area determined by the Army Corps.</p>	<p>Three different methods are used to evaluate proposed offsets:</p> <ul style="list-style-type: none"> • Indices based on easily observed characteristics that act as surrogate indicators of ecological functions such as percentage cover of aquatic vegetation • The presence particular wetland services such as wildlife habitat • The presence broader systems covering a range of wetlands services
USA <i>Conservation Banking in the US under the Endangered Species Act 1973 and Guidance on the Establishment, Use and Operations of Conservation Banks</i>	
<p>Under the ESA it is illegal to harm any species listed as endangered or threatened without obtaining incidental take authorisation through the National Marine Fisheries Service or the Fish and Wildlife Service.</p> <p>Landowners must prepare a Habitat Conservation Plan if a species that is endangered or threatened under the ESA is on their land. The plan must minimise and mitigate the impacts of the development activity. The system allows developers impacting on an endangered species to buy species specific credits from 'conservation banks' (private entities that protect specific species with a view to selling species specific mitigation credits).</p>	<p>Banks should be sited where they can reduce the threat of fragmentation and provide management measures that address threats to the species</p> <p>Must be based on sound scientific principles and must fit in with conservation needs of the species, this could include habitat preservation rather than a species focus</p> <p>Must consider land use changes in surrounding area</p> <p>Active management programme is required</p> <p>Must provide biologically comparable habitat to the affected area and be of sufficient size to maintain ecological integrity into perpetuity with an appropriate buffer against edge effects</p> <p>A combination of on and offsite measures are permitted and the ratio required will depend on the species in question</p>

Appendix 2: Principles for the design of biodiversity offsets

1. New South Wales principles for green offsets (NSW 2002)

- Environmental impacts must be avoided first, by using all cost effective prevention and mitigation measures. Offsets are then only used to address remaining environmental impacts
- All standard regulatory requirements must still be met
- Offsets must never reward ongoing poor environmental performance
- Offsets will complement other government programmes
- Offsets must result in a net environmental improvements
- Enduring – they must offset the impact of the development for the period that the impact occurs
- Targeted – they must offset the impacts on a 'like-for-like or better' basis
- Located appropriately – they must offset the impact in the same area
- Supplementary – beyond existing requirements and not already being funded under another scheme
- Enforceable – through development consent conditions, licence conditions, covenants or contract

2. Western Australia principles for environmental offsets (WA EPA 2004)

The Western Australia Environmental Protection Authority put forward a policy statement for consultation on the use of environmental offsets to meet environmental goals. They set out a series of principles which are based on the assumption that offsets should aim to achieve a 'net environmental benefit'. They are as follows:

- Environmental offsets should only be considered after all other attempts to mitigate adverse impacts have been exhausted.
- An environmental offset package should address both primary offsets and secondary offsets.
- Environmental offset and impact should ideally be 'like-for-like or better'.
- Positive environmental offset ratios should apply where risk of failure is apparent.
- Environmental offsets must entail a robust and consistent assessment process.
- Environmental offsets must meet all statutory requirements.
- Environmental offsets must be clearly defined, transparent and enforceable.
- Environmental offset must ensure a long lasting benefit.

3. Wetland banking in the USA (EPA 1990)

In the USA, wetland banking is governed by the principle that impacts should be avoided where possible, minimised where practicable, and compensated for where unavoidable. Guidance on this is set out in a Memorandum of Agreement between the Department of the Army and the Environment Protection Agency. The key elements of this guidance are:

- There should be no overall net loss to wetlands, although, it is recognised that no net loss may not be achieved for all permits
- In-kind is preferable to out of kind compensation and areas involved should be adjacent or continuous to the impacted site or in close geographic proximity
- Preservation of existing wetlands as compensation for destruction of wetlands is acceptable only under exceptional circumstances
- A minimum 1:1 ratio is acceptable for compensation activities. This should be adjusted according to the biological value of the land in question