biodiversity neutral initiative

An Analysis of Voluntary Biodiversity Offsets

A review of literature and case studies

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Abstract

In this paper I provide an overview of the concept of voluntary biodiversity offsets, based upon present literature and corporate policies. First, I define biodiversity offsets and present the social trends along with the legislative frameworks that paved the way for the development of this voluntary mechanism. Second, I outline the benefits that governments and the conservation community can gain from offsets. Third, I discuss the standards required for offsets to be properly implemented as a biodiversity management tool and identify several hypothetical offset examples. Fourth, I address the various challenges facing offset proponents and provide two case studies to illustrate the implementation of the requirements as well as the issues surrounding an improper offset. Next, I outline the significant benefits that can be derived by corporations from the implementation of voluntary biodiversity offsets. After which, through the analysis of several case studies in which corporations have implemented partial or comprehensive biodiversity offset plans with varying degrees of success, I discuss the emerging trend for corporations to offset their footprints. Finally, by evaluating the biodiversity policies of Canadian corporations in several industries, I assess the future applicability of biodiversity offsets in Canada.

Context

Widespread threats to biodiversity around the world have prompted governments and other organizations to change their strategies for conserving biodiversity (BBOP 2007). Eleven years ago, Ambassador James Pipkin, Assistant to the Secretary of the US interior, identified a change in general conservation strategies from traditional single species management to total ecosystem management or biodiversity management (Mattice 1996). While conservation efforts have traditionally come from the public sector, Richard Caines, a manager in the International Finance Corporation's (IFC) Social and Environmental Development Department, recently explained that in order to decrease the accelerating rate of biodiversity loss "we must mobilize the private sector to reach goals because it is the main engine of wealth" (Ness 2006). Furthermore, corporations themselves have been continually raising the standards expected for corporate responsibility practices and reporting over the past decade. These shifts from individual species-focused conservation to comprehensive biodiversity conservation, and from public to private sector stewardship, have paved the way for the development of a comprehensive corporate biodiversity management tool called *biodiversity offsets*.

Biodiversity offsets are voluntary conservation actions specifically designed to compensate for residual, unavoidable harm caused to biodiversity by development activities, resulting in *no net loss* of biodiversity (ten Kate et al. 2004; BBOP 2007; ICMM 2005; IFC 2006). While environmental stewardship and footprint minimization programs have become common corporate practices, it is widely acknowledged that negative impacts can rarely be entirely eliminated, resulting in a continual degradation of biodiversity (IFC 2006; ICMM 2005; ten Kate et al. 2004; McKenney and Gullison 2006). Offsets represent a way to incorporate national and regional conservation goals into business sector agendas as they "compensate for the deterioration and destruction of natural habitats and their resident biota" (BNI 2004). Offsetting impacts to biodiversity is relatively new and there is considerable debate in the conservation community concerning its overall effectiveness (ten Kate 2004). Despite debate, companies are already signing on to the concept. For example, the large mining corporation, BHP Billiton, has committed to causing net zero harm to biodiversity. Rio Tinto, another mining company has promised to produce a "net positive benefit" (ICMM 2005). These bold corporate goals suggest that attractive incentives exist for businesses to take responsibility for their entire footprint and become *biodiversity neutral* or *biodiversity positive*, meaning that they have a neutral or positive impact on biodiversity.

Although biodiversity offsets are *voluntary* environmental management tools, some argue that the voluntary offset programs should be based upon several legislative frameworks that exist in the United States, Canada, Brazil, Australia and the European Union (ten Kate et al. 2004; IFC 2006; McKenney and Gullison 2006). Each country has passed legislation that requires certain development projects to compensate for their unavoidable impacts to the environment by following prescribed guidance steps. In the United States, both the Federal Wetlands legislation and the US Species Conservation Act require unavoidable developments to offset their effects on wetlands and endangered species by investing in compensatory conservation projects (McKenney and Gullison 2006). The United States has established sophisticated wetland mitigation banks and species conservation banks that allow developers to buy credits to offset their impacts, much like the present day carbon credit systems (ten Kate et al. 2004). In Canada, the Fisheries Act stipulates that development projects must have a no negative impact on fish productivity, and the Policy for the Management of Fisheries Habitat provides guidance for development projects to compensate for their unavoidable adverse impacts (DFO 1986). The EU Natura 2000 sites, the Australian offset program and the Brazilian offset system are less established but have similar requirements for developers to prevent net environmental harm (McKenney and Gullison 2006).

Offset policies offer many benefits to governments as well as conservation communities (ten Kate et al. 2004). In the past, conservation legislation has negatively impacted landowners by reducing the monetary value of land inhabited by endangered species. As a result, landowners are inclined to illegally eliminate protected species found on their land in order to maintain its value. Offset legislation gives value to inhabited land because the land can be sold as an offset, therefore aiding the original landowner and reducing the negative impacts of conservation legislation. Similarly, numerous conservation organizations recognize the benefit that a strong offset program can offer them. Offsets provide the flexibility to achieve the best and most efficient conservation outcome. For example, during the rehabilitation process of a mine site, a developer may find that higher levels of biodiversity can be achieved by creating an offset to compensate for a small but costly portion of the rehabilitation scheme. Furthermore, the offset may result in a more cost-efficient method of restoring biodiversity to an area (ICMM 2005; ten Kate 2006). Furthermore, the goals of the conservation community will benefit from corporate biodiversity offsetting, if greater levels of biodiversity conservation are achieved. Finally, as corporations are increasingly inclined to advertise their offset projects, they can help to achieve an increased global awareness of conservation issues.

The Practice of Applying Biodiversity Offsets

Overview of offsetting process

A developer must consider several complex elements when choosing to offset their impact to biodiversity. The two main components involved in the offsetting process are the development project and the offset project. The development project refers exclusively to the project that will negatively impact biodiversity in some way. Mine sites, housing lots, pipeline tracks, oil drill sites, building sites, roads, and railways are all examples of development projects that commonly cause adverse impacts to biodiversity (ten Kate et al. 2004). The second main component of the offset process is the offset project, which refers to the conservation effort intended to compensate for the adverse impacts caused by the development project. The development project's negative effect on biodiversity must be equal or less than the biodiversity that the offset project supplies (McKenney and Gullison 2006).

Choosing an appropriate development project

To credibly protect biodiversity, according to regulatory frameworks there are three steps that all development projects should adhere to: avoidance, followed by minimization and finally, compensatory mitigation (McKenney and Gullison 2006). The sequence of conservation steps is often referred to as *the hierarchy of preferred actions* in corporate and scientific environmental policy documents. The compensatory legislative frameworks for biodiversity protection in the United States, Canada, Australia, Brazil and the EU generally include this three to four step sequence. In the avoidance step, the developer should choose the least environmentally sensitive site, thereby avoiding *unacceptable* impacts (McKenney and Gullison 2006). A key element of this first step is to establish a 'No Go' policy that forbids the proponent to develop in particularly sensitive and biologically diverse areas. The International Council on Mining and Metals (ICMM) (2005) maintains a "No Go" policy that prohibits exploration in World Heritage Sites and in Category I-IV sites identified in a dialogue developed in conjunction with the World Conservation Union (IUCN).

In the second step (minimization) the development project should be designed in a manner that minimizes its adverse impacts to the point that no *avoidable* effects remain, within the constraints of maintaining economic viability. This could include increasing energy efficiency, using technologically-advanced equipment, and perfecting waste and water management systems. Minimization may include rehabilitation of the development site at the end of a project, by re-introducing impacted species and ecological processes (ICMM 2004; EBI 2006). While the developer should leave a site with equal or higher levels of biodiversity than existed prior to project initiation, this goal is usually extremely expensive and impossible to achieve. There is a trade-off between achieving complete on-site remediation and producing the best biodiversity outcome, which refers to the solutions that produces the greatest increase in biodiversity. The resources spent on 100% rehabilitation may be more effectively spent on off-site biodiversity conservation (ten Kate et al. 2004).

Finally, the developer should implement compensatory mitigation to offset impacts that could not be eradicated by avoidance and minimization (ten Kate et al. 2004; McKenney and Gullison 2006). The order of conservation actions from avoidance to mitigation, ensures that offsets are not used to make potentially avoidable projects more acceptable, which is a concern of many conservationists (McKenney and Gullison 2006; IFC 2006). Instead, offsets should be used as mechanisms to improve environmental stewardship beyond what is possible with avoidance and minimization (BNI 2004).

Leading companies have adopted the three part mitigation hierarchy. For example, in 1998 the crown energy corporation Ontario Power Generation developed a biodiversity policy that follows the hierarchy of preferred actions. "OPG will avoid damage, and where unavoidable will restore all that can be recovered, and will replace habitat in kind as a last resort" (OPG 2005). The company has received acclaim from the World Business Council for Sustainable Development and the Wildlife Habitat Council for its environmental performance due to its adherence to the hierarchy. Similarly, NAM, a Dutch natural gas company owned by Shell, has created an explicit protocol that requires all projects to minimize impacts before compensation projects can be considered (ten Kate et al. 2004).

Requirements for the offset project

After the development project has been properly planned and its impacts have been assessed, several factors must be taken into account during the development of an acceptable offset project. These factors include the establishment of equivalence, currency units and an accurate ratio

between the development project and the offset project. Furthermore, timing and duration of the offset must be taken into account. Finally the offset should satisfy the requirements for additionality.

Biodiversity offsets are based on the idea that compensation for the negative impacts of a development project can not be achieved solely by providing social and economic benefits to communities and the economy (ten Kate et al. 2004). In order to neutralize impacts a developer must employ "like-for-like" tradeoffs. There is ongoing discussion among conservationists and biodiversity offset experts surrounding the criteria that characterize a legitimate offset or compensatory project. Based upon the best practices where offsets are legally required, several common criteria exist. The offset must be "equivalent", meaning the offset must create an increase in biodiversity at least equal to the decrease in biodiversity caused by the development project (McKenney and Gullison 2006; ten Kate et al. 2004). Establishing equivalence ensures that the biodiversity offset provides an increase in biodiversity equal to or greater than the decrease caused by the development project. This state of equality is often referred to as "no net loss" or a "net positive benefit" to biodiversity (ten Kate 2004).

In order to calculate equivalency, developers must provide baseline data on the biodiversity present at the development site, as well as their predicted direct and indirect impacts (ten Kate et al. 2004; IFC 2006). This calculation of a project's potential impacts on biodiversity is often difficult because several assessment methods exist and there is a lack of consensus in the scientific community as to which method provides the most accurate and cost-efficient estimate. There is considerable debate about whether the composition, the structure or the function of an ecosystem should be offset. Furthermore, no consensus exists surrounding where the boundaries are when it comes to calculating indirect impacts. Should a developer account for and offset the impacts to biodiversity caused by their suppliers and their clients (McKenney and Gullison 2006; ICMM 2005)? Partnering with conservation organizations, NGOs, consultants and communities can be immensely helpful in determining a project's impact and the necessary offset (IFC 2006).

One popular method used by corporations to estimate their footprints is the Environmental Impact Assessment (EIA). The Convention on Biological Diversity has developed best practice guidelines for incorporating biodiversity into the EIA process (CBD 2005). During the screening process, while developers determine which project proposals should be included and which can be excluded from the EIA, biodiversity should be included in the considerations despite the fact that it is not a legal requirement. During the scoping phase of the EIA authorities determine the focus and the key issues that should be studied in detail for the EIA. At this phase the assessment should involve the consideration of all alternative options that would help to avoid impacts. Scoping should involve the development of the hierarchy of preferred actions (*avoidance, minimization, restoration* and *compensation*) for the development project. When the assessment, evaluation and development of remaining alternatives are carried out, criteria should be established to help authorities measure biodiversity. The EIA is then reported and an assessment of the findings is carried out to allow for the ultimate decision-making process with regards to the project and its environmental impact. As biodiversity has been considered throughout the assessment process, it should also be a factor in the final decision. Finally, as the project progresses, continual monitoring, compliance, enforcement and auditing should ensue to identify any changes or unidentified environmental impacts (CBD 2005).

The currency, used to calculate development impacts and benefits from a proposed offset, is critical to establishing equivalence. Currency refers to the units used to compare an offset to the development project. In determining currency, the project proponent must account for the type, location, quality and quantity of the offset that will adequately compensate for the loss of biota

caused by the development project (ten Kate et al. 2004). The ideal offset would take place on the site of the development project, or very nearby, and would be placed in the same ecosystem type that the development project impacts (McKenney and Gullison 2006; ten Kate et al. 2004; BNI 2004; ICMM 2004; IFC 2006). Therefore, an acceptable currency has to account for both proximity to the impact location, and ecosystem type. The currencies most commonly used are area of land (acre, hectare) in similar ecosystem types or species richness, for lack of better mechanisms to calculate and compare biodiversity. However biodiversity experts are working to develop a more accurate, applicable method (BNI 2004; BBOP 2007; ICMM 2005). The ratio of the compensation to negative impacts, calculated using the chosen currency, should be greater than one in order to account for the risk of offset failure and unforeseen development impacts. The Canadian Fish Habitat Policy (Farrell 2007) requires a ratio of two to one for habitat compensation projects. For wetland banking in the US, a land area ratio of three to one is common.

Duration and timing should also be considered when establishing an offset project. Some parties state that the offset should be maintained, at a minimum, for the duration of the impacts caused by the development project (McKenney 2006; ten Kate 2004; ICMM (2005)). In addition, the offset project should be completely established before development begins. Others believe that all offsets should be perpetually maintained. This can be difficult to guarantee due to unforeseeable changes in legislation, corporate financial situations and priorities, and therefore only projects that cause permanent damage to biodiversity require perpetual compensation. However, these obstacles can be overcome through the establishment of trust funds to perpetually support the offset. Nonetheless, an offset maintenance system should be established with adequate funding for the lifespan of the offset to ensure its success.

Additionality is possibly the most important requirement for a legitimate offset project. Additionality means that a compensatory project must make contributions to the conservation of biodiversity that would not have existed without the offset (ten Kate et al. 2004). For example, a developer could remediate previous impacts, or contribute to existing conservation projects that are obviously threatened by lack of funding. However, investing in land that is unlikely to be threatened by development or destruction in the first place would not satisfy the condition of additionality (McKenney and Gullison 2006). A unique example of additionality is Rio Tinto's effort to offset their biodiversity and carbon impacts through their "Minding the Carbon Store" project in Queensland, Australia. The region was expecting the release of legislation banning any clearing of natural vegetation. As a result, many local farmers began clearing their land prior to the legislation's release. Rio Tinto paid those farmers to refrain from clearing their land which resulted in the protection of 13, 000 hectares of natural forest and prevented the release of one million tonnes of carbon. Because the land would have been cleared were it not for Rio Tinto's commitment, the company succeeded in establishing additionality (Rio Tinto 2006). Furthermore, Rio Tinto gained ownership of the stored carbon through The Carbon Store, an Australian carbon trading company.

Potential Offset Activities

Once the avoidance and minimization steps have been planned, the baseline data for the residual impact has been calculated, and the currency mechanism has been determined, the offset project can be established. Although the type of offset depends entirely upon the residual effects of the development, there are several common approaches: (1) Buy forestland that would have otherwise been developed and leave it untouched; (2) Invest in native ecosystem restoration on private lands by paying local farmers to restore their farmland to its natural state (Gullison and Hardner 2007); (3) Aid local conservation sites in need of protection, much like Rio Tinto's World Heritage Site project; (4) Establish a buffer zone around a park reserve and decrease the likelihood of outer penetration by local loggers or other destructive forces; (5) Reintroduce native

species or eliminate alien species, resulting in an upgrade in the conservation value of the land (BBOP 2007); or (6)Invest in the creation of conservation corridors that connect one reserve to another. Other options include protecting important marine areas, establishing secure migration pathways or even removing domesticated grazers like goats from overgrazed sensitive sites (BBOP 2007).

It is important to realize that by committing to become "biodiversity neutral" or have "no negative impact" upon biodiversity, companies are making very ambitious goals. The commitment is likely to entail much more that offsetting their physical footprint, but rather a consideration and reduction of all aspects of a company's operations that might have adverse impacts on biodiversity in the short term and long term. For example, a company pledged to "net neutrality" might also consider and compensate for impacts to biodiversity caused by greenhouse gas emissions, other air pollution, and water contamination. By investing in carbon credits or planting forests, net greenhouse gas emissions can be eliminated, and by investing in offsite water improvement projects can compensate for on-site water use resulting in a more accurate net zero or net positive impact (Gullison and Hardner 2007).

Methodological Challenges

It is difficult to define a standardized set of criteria for voluntary offsetting; because of the complex nature of biodiversity, each offset case is unique (ten Kate et al. 2004). Although the literature on legislative frameworks shows that there is some convergence for mandatory offset criteria, voluntary offsets allow for considerably more flexibility in the planning and execution stages. Because conditions for an offset project are rarely optimal and not all criteria can be perfectly met, several methodological challenges must be addressed. For example, one of the main difficulties faced by off-setters is how to decide whether and when an offset is appropriate (BBOP 2007). Moreover, there is continual debate about what constitutes one offset unit and how to compare it to one unit of biodiversity damage, not to mention how to measure biodiversity in the first place (McKenney and Gullison 2006). Quantifying indirect impacts presents another problem. If a development project indirectly results in more people moving to an area, should the developer include the impacts of the immigrants in the offset (ten Kate et al. 2004)? Furthermore when designing an offset project should a developer always offset on-site as opposed to off-site, even if the off-site option is of higher biodiversity value? Ultimately, when such an extensive number of issues must be considered in order to establish an offset, how can the criteria be condensed to define what is an acceptable offset versus what is a simple conservation effort.

Rio Tinto, Kennecott Utah Copper Mine: A comprehensive offset project

In order to illustrate how the criteria for an acceptable offset project are used to create an offset, I provide a simplified example of an offset developed for the Kennecott Utah Copper Mine. Rio Tinto has been involved in several biodiversity compensation projects that fulfill the necessary criteria for an acceptable biodiversity offset, including one at the Kennecott Utah Copper Mine near Salt Lake City (Kennecott Utah Copper 2000; ten Kate et al. 2004). Kennecott Utah Copper, a subsidiary of Rio Tinto, created an offset project to compensate for the impacts of a tailings facility. While the company was required by US law to offset their impacts to wetlands, Kennecott decided to go beyond the required one-to-one ratio and implement a two-to-one compensation ratio instead. By using a larger ratio, the company accounted for the risk of failure of the project. The offset project was developed in 1996 by a Technical Advisory Committee comprising members from a variety of environmental organizations, which allowed for input from varied professionals and stakeholders. The project involved the creation of a 1011 hectare waterfowl and shorebird refuge to compensate for the company's 427 hectare negative impact on similar wetlands. Although the offset was off-site, it was less than one kilometre from the

development site. The company chose this location because it represented a better conservation option that closer sites. The committee was careful to mitigate construction during the offset project and was in charge of its operation, maintenance and monitoring. The establishment of the committee guaranteed that the site would last at least as long as the development impacts. Over a period of five years bird use of the site increased 1000 times, satisfying the criterion of additionality. In 1997 the site was expanded to 1460 hectares which further demonstrated the company's commitment to conservation (ten Kate 2004). Despite the fact that the offset only compensated for the tailings area and further offsetting would be needed to offset the impacts of the entire mine, it is an early example of the proper procedure and rigor required to establish no net loss to biodiversity. The company's use of the concepts outlined above helped to ensure that the offset was accepted by all stakeholders and that the company would gain as much benefit from its establishment as possible.

Wal-mart's Acres for America: Offsetting or green-washing?

Wal-mart's Acres for America (2006) project provides a solid example of a large-scale conservation effort disguised as a rigorous offset project. The company's stated objective for Acres for America is to establish impact-free site selection and construction in the United States (Wal-mart 2006). To accomplish this goal, Wal-mart is developing a policy for selecting sites (avoidance) and using low-impact construction techniques (minimization) which they've begun to implement with their new experimental high efficiency stores in Texas and Colorado. In a partnership with the National Fish and Wildlife Foundation, it has begun to offset its footprint by conserving one acre of priority wildlife habitat for every one acre of land developed by the company over the next ten years. Wal-mart has already permanently conserved 141,640 hectares of habitat and has committed a financial investment of $35 million over ten years. In 2006, the program contributed $500,000 to help conserve 3.2 kilometres of Lake Michigan shoreline on which a trail system will be built for public access. In the same year, the program gave $1 million to help conserve timberland in California; however, sustainable timber harvesting was allowed to continue on the land.

While the program does follow the hierarchy of preferred actions, there are several issues with Wal-mart's offset plan. First, the project lacks a rigorous currency system to compare impacted biodiversity to conserved biodiversity. Instead, the company considers all parcels of land equal, even though an acre of fish habitat is vastly different from an acre of grassland or wetland destroyed to build a store. The strategy assumes that conserving high priority habitat offsets their footprint. Some would, however, consider this a good assumption because it is likely to result in funding going to the best and highest conservation option. Second, the offsets generally take place far from the actual store sites rather than on-site or nearby which would guarantee a more accurate offset and provide benefits to the communities affected by the development. Third, the offset plan does not require that conservation is additional to the status quo (e.g., the sites may have been conserved regardless of Walmart's actions). Finally, it is not clear whether Wal-mart consulted with stakeholders during the decision process. Instead, the company simply handed the money over to the National Fish and Wildlife Foundation to make the decisions for them.

Acres for America is an extensive and commendable conservation project. However it makes little association between the biodiversity affected by development and the biodiversity conserved and as such, it cannot be defined as an acceptable offset for the corporation's footprint. Nonetheless, the company expresses an interest in implementing offsets for its international stores, which would provide an opportunity to develop a more rigorous offset plan. It is probable that most Wal-mart stores are built on degraded lands in the first place rather than highly sensitive natural vegetation, in which case committing to conserve high priority habitat is more effective than offsetting the degraded land on which they develop. On the other hand, the Acres

for America seems to ignore the destructive environmental impact that Wal-mart imposes through outsourcing its manufacturing to less developed countries like China with weak environmental regulations. Furthermore, the chain has helped to create an extremely disposable culture in which people throw away broken appliances and buy new ones rather than get them fixed. Finally, considering that very few customers walk to Wal-mart, the company's indirect impacts on greenhouse gas emissions must be immense. The Wal-mart case demonstrates a situation where offsets may not be the best option for the company, particularly because they are not created within the context of a company-wide, comprehensive biodiversity management strategy.

Business Incentives for Employing Biodiversity Offsets

While offsets provide enticing benefits to conservation communities and governments, most literature focuses on the many benefits that businesses gain from offsetting their footprints. Businesses explain that the pressure to be responsible environmental stewards is no longer an exclusively external force (Ness 2006). Richard Caines of the Environmental and Social Development Department at the International Finance Corporation (IFC) explains that the pressure to be environmentally responsible is now present internally, due to the substantial benefits that a company stands to gain through biodiversity stewardship (Ness 2006). The IFC (2006) argues that "an offset can provide a number of additional benefits to companies, including enhanced credibility and demonstrated leadership in an evolving field". An article for the Business and Biodiversity Offset Program concerning the rising corporate interest in biodiversity offsets addresses several incentives for businesses to offset their unavoidable impacts (Ness 2006). Similarly, the International Council on Mining and Metals (2005) has outlined the numerous benefits to business that can be gained by implementing a comprehensive biodiversity offset program, emphasizing its efficiency as a risk-management strategy.

Biodiversity offsets provide benefits that tend to be attractive to specific sectors and corporations. Companies that have a tendency to develop or disrupt natural land on a regular basis generally stand to gain more from offsetting than those that disturb extremely degraded lands. Furthermore, companies with high profile activities, particularly if those activities have a tendency to be located in areas with high levels of biodiversity, tend to find offsets attractive as corporate biodiversity management tools. Mining, oil and gas, and utilities companies are more commonly interested in offsets than retailers or real estate developers, because their success depends heavily upon reputation, stakeholder support, access to land, and access to capital. However, this is not exclusively the case, and companies in other sectors may find that they too stand to gain immensely from good practice in biodiversity management (Gullison and Hardner 2007).

Stakeholder interest and license to operate

A company that wishes to maintain the support of its stakeholders may gain immensely by introducing a biodiversity offset policy (Buse 2005). As communities increasingly recognize the value of ecosystem biodiversity, companies that do not take responsibility for their impacts can lose public support, investors and customers (Mattice 1996). The ICMM (2005) predicts that mining companies will experience more participation from investors, a better reputation in the community, and strong partnerships with NGOs as a result of implementing a strong, visible biodiversity protection plan. Furthermore, the council claims that by taking responsibility for their impacts, companies in the mining sector will engender a sense of pride and loyalty among their employees (ICMM 2005; ten Kate et al. 2004). Because stakeholders hold the power to

revoke a company's social license through letters, protests and other forms of negative publicity, stakeholder support is crucial to a company's license to operate (ten Kate et al. 2004; IFC 2006). Biodiversity offsets, particularly when established where they are visible to the community, can represent a key element in a successful business development plan.

Reputation

A policy for offsetting residual damage to biodiversity can help a corporation to build a strong and trustworthy reputation (IFC 2006; ICMM 2005). Companies like Rio Tinto and Ontario Power Generation have won prestigious awards and international recognition for their efforts to protect biodiversity. A strong environmental reputation will help a company establish trusting relationships with regulators and obtain permits at an efficient pace (ICMM 2005; ten Kate et al. 2004). By gaining the trust of permit officials, developers will be more likely to avoid costly legal fees and delays. Because access to land depends on permission from authorities and community members, multinational corporations that move first within their sector to establish the best environmental practices and reputation, can find that they hold a competitive advantage (Ruse 1996; ten Kate et al. 2004). In addition, as ore bodies become scarce and mining projects are increasingly located in biologically rich areas, access to land will become increasingly crucial and a company's environmental reputation may be a deciding factor in the success of a project (ICMM 2005).

Rio Tinto's Flambeau Copper Mine in Utah provides an example of the benefits that a company can gain from a strong environmental reputation. The land required for the Utah mine was abundant with sensitive biodiversity. Rio Tinto has recently adopted a policy to achieve a "net positive benefit" (Rio Tinto 2004) on biodiversity in all of its projects. Due to the company's positive reputation it was able to gain the trust of permit authorities, and the project was eventually approved (Kosich 2006). The mine site was home to 12 important wetland species as well as 15 threatened species of vegetation and wildlife in grass and woodlands. During the project, Rio Tinto conserved 73 hectares of nearby land and monitored bald eagle populations. In 1997 site rehabilitation was initiated, and 267 native species, including prairie grasses, wetlands plants, wildflowers, 45 bird species, 20 butterfly species, several amphibian species and deer had been reintroduced by 2003. Not only did the company conserve during the project, but it also replaced the degraded wetlands of the original mine site with high quality wetlands, leaving a net positive impact. While United States wetland and endangered species legislation played a role in the company's conservation efforts, the case study demonstrates the importance of a company's reputation in gaining access to land, as well as regulator and community trust (Rio Tinto 2006; ten Kate et al. 2004).

Access to capital and first mover competitive advantage

Biodiversity offsets can help companies fulfill the strict criteria needed to gain access to capital. In 1988 the IFC introduced the Safeguard Policies through which it refused to finance projects that involved the conversion of natural vegetation and habitat without compensation. When destruction of natural vegetation and habitat is unavoidable, the company is required to mitigate and compensate through offsets (ten Kate et al. 2004). Today forty-one lending institutions maintain strict environmental guidelines for financing development projects (World Bank 2007). The World Bank and the IFC will not lend unless companies commit to the protection and conservation of biodiversity that takes into account the risks of the development project. Although this requirement has been under-enforced in the past, 85% of all global loans now demand the same requirement and enforcement is improving (Ness 2006).

There is wide consensus among corporations that as global environmental goals become more demanding, governmental regulations will increase (McCarthy 2007). While the concept of biodiversity offsets is still developing and governments are contemplating new compensatory legislation, companies that get involved in the elementary stages will capture the first mover's competitive advantage and potentially influence policy and regulatory regimes (ten Kate et al. 2004; Ness 2006). The IFC (2006) supports this theory, explaining that "companies that establish themselves as early participants in this field may be able to influence laws and policies."

The experience of the oil and gas company Camisea demonstrates how poor environmental performance can lead to loss of capital as a result of the Safeguard policies. In 2004, Camisea, began a natural gas project in the Peruvian Amazon (Amazon Watch 2006). The project became known as one of the most damaging projects in the Amazon basin in the 21st Century (Amazon Watch 2006). Within the first two years of operation, the large gas pipeline that ran through a biodiversity hotspot, described by scientists as one of the most damaging places on earth to drill for fuel, had ruptured four times with at least three major spills. The company's lack of environmental mitigation and conservation is believed to have led to the withdrawal of funding from their major financer, the US Import Export bank (ten Kate et al. 2004).

Lower compliance costs and new market opportunities

Offsets can be cost-effective in cases where an extractive company is under terms to completely restore a site (ten Kate et al. 2004). Because there are diminishing returns to rehabilitating a site 100%, offsetting the final, most expensive part of the rehabilitation can allow a company to save on costs while achieving a better conservation outcome. Moreover, companies can encounter new market opportunities as worthless land becomes worth its offset potential (ten Kate et al. 2004). While both concepts imply that biodiversity offsets offer promising and potentially cost-efficient biodiversity management techniques, it is crucial to keep in mind that the benefits that they provide to a company depend heavily on stakeholder support.

A good example of the value of offsets is provided by Northumbrian Water, a United Kingdom utilities company. The company could have saved on costs by offsetting its effects on endangered species rather than relocating the threatened animals. Under the EU Habitats Directive, Northumbrian Water was legally required to offset its impacts on great crested newts due to the discovery of ten new newts in their concrete water treatment center. The EU directive charges a 5000 pound fine for every newt destroyed. Northumbrian Water makes a priority of caring for the threatened newt species and generally relocates them when they are discovered (Northumbrian Water 2006). Instead of investing in the conservation or breeding of ten newts elsewhere, the company relocated the newts to a man-made pond at a cost of 250, 000 pounds. By offsetting the newts and investing in natural land, the company might have chosen a more effective solution, both in terms of economic cost and conservation value (ten Kate et al. 2004). On the other hand, if stakeholders demonstrated that they valued newt relocation more than newt compensation; Northumbrian Water may have chosen the proper solution.

The establishment of conservation banks in the United States demonstrates one way in which offsets offer the opportunity to create new business. While they are the result of legislation, these banks provide inspiration for new ideas among voluntary compensation projects and they illustrate future possibilities as biodiversity offsets gain popularity.

The International Paper Company provides an example of a serious conservation issue that was turned into a profitable opportunity by implementing offsets. When the company discovered 18 red-cockaded woodpecker clusters in their forests it chose to turn the issue into a revenue opportunity. Because the woodpeckers are difficult to relocate and their natural habitat of long-

leaf pine trees is disappearing, the company decided to upgrade 2, 145 hectares of long-leaf pine forest in Georgia and breed the birds to offset the harm that might come to the 18 clusters in their development forests (International Paper 2003). Additionality was achieved because the conserved land was upgraded to the quality required for woodpecker habitat and the birds initially in the forest would not have survived. After five years of breeding, eleven clusters (44 birds) lived on the reserve and International Paper estimated that the forest would hold nineteen more. By breeding thirty red-cockaded woodpecker clusters, the company would create a surplus of twelve clusters which they could sell as offsets to other interested companies. On the American Species Conservation market, red-cockaded woodpecker credits sell for $150, 000 to $250, 000 each. Therefore due to compensatory mitigation practices, International Paper was able to create a business opportunity from what would otherwise have been a development disadvantage. While mandatory conservation legislation and an established offset market aided immensely in this case, as voluntary offset projects become common practices, companies could conceivably create similar business opportunities with biodiversity offsets as long as proper project criteria are fulfilled (ten Kate et al. 2004).

Case Studies

The OCP and Chad-Cameroon Pipelines: Consequences of improper offsets

The establishment of the Oleoducto de Crudos Pesados (OCP) pipeline in the Amazon of Ecuador in 2003 led to many arguments and protests from NGOs over its damaging impacts to biodiversity (IFC 2006; Amazon Watch 2006). The project was delayed by ten years due to protests and licensing issues. The OCP cuts through seven national parks and reserves, including an extremely sensitive cloud forest and has been said to violate the World Bank's most minimal environmental requirements (Amazon Watch 2006). The pipeline's disregard for environmental responsibility and social rights cost the project $200 million in fines and delays. When the shareholders (the largest shareholder being Canadian-based Encana) proposed offsetting the project's negative impacts, the NGOs would not accept the proposal, claiming that offsets would distract from the company's responsibility to reduce the impacts of the pipeline. If a developer lacks the support of environmental NGOs for an offset project, then the potential benefits from the offsets become worthless. This case study illustrates the importance of the avoidance and mitigation steps in the hierarchy, as well as the need for support from environmental organizations in the offset establishment phase (ten Kate et al. 2004).

To offset the Chad-Cameroon pipeline, Exxon-Mobil, Petronas and Chevron partnered with the World Bank to create two large national parks (ten Kate et al. 2004). In establishing the parks, the companies considered the negative impacts to indigenous communities as a result of the pipeline. The parks are funded in perpetuity. Although the park designs satisfied timing, ratio and currency requirements for offsets and accounted for stakeholder interests, a road was built through the parks, detracting from the ecological integrity of the previously undeveloped reserves. A targeted campaign against the companies promptly began on the internet and while the benefits from the parks outbalanced the road's impact, this fact was lost among the negative publicity. This example shows that every detail of an offset project must be accounted for in the planning stage, particularly when development projects are in high profile areas and companies tend to be negatively targeted in the press. A company should assess community attitudes before it decides to detract from the purity of the offset by building roads or trails, otherwise the benefits to the company that offsets can provide will be negated by negative publicity.

BBOP Pilot Cases: Experiments in comprehensive biodiversity offsetting

The Business and Biodiversity Offset Program (BBOP) aims to develop a universally accepted model for biodiversity offsets that can be implemented by an extensive variety of developers. Six companies have partnered with the organization and other NGOs to implement pilot biodiversity offset projects around the world. These companies have committed to creating rigorous voluntary offset plans with the help of environmental specialists and have agreed to document their procedures. Offsets will be established by Shell Pearl in Qatar, Newmont Gold Mine in Ghana, Anglo-American Platinum Mine in South Africa, Ambatovy Nickel Mine in Madagascar, Bainbridge Real Estate on Bainbridge Island in Washington State, USA, the Road and Massai Tourism Lodges in Kenya, and Rio Tinto in Madagascar (BBOP 2007). Little information is available about offset development at the Shell Pearl site or the Kenyan tourism lodges, and the Bainbridge Island and the Anglo-American offset projects are still in the early stages of development. On the other hand, Rio Tinto, Dynatec and Newmont have invested significant time and energy into assessing their impacts and planning offsets at their project sites in Madagascar and Ghana.

Dynatec, Madagascar: A detailed offset project proposal

Dynatec Corporation of Canada, a growing mining company based in Richmond Hill, Ontario, received environmental approval in December of 2006 from the Madagascar government for its Ambatovy Nickel Mine proposal (Dynatec Corporation 2006). The project is planned to take place over 27 years and the company plans to mine an estimated 17 square kilometres over that time period. Since 2004, Dynatec has been conducting a comprehensive and extensive environmental assessment (EA) of baseline data in the area and the mine's predicted impacts. A comprehensive analysis of the ecosystem types as well as the individual species in the area was completed. Furthermore, mitigation mechanisms have been included into the mine's construction and operation plans. The EA predicts a cumulative loss of 1, 326 hectares of sensitive vegetation and the reclamation projects will primarily involve replanting a slightly different type of vegetation.

In order to account for the inability to completely restore impacted sites during the rehabilitation stage, Dynatec's biodiversity specialists have worked with independent stakeholders to create a comprehensive offset plan that will result in no net loss. The Ambatovy EA (2006) states that "the proposed compensation plan should provide more positive long-term benefits to the region than if the status quo (no project alternative) were to remain". Dynatec has proposed an offset plan that includes two on-site conservation areas that total 305 hectares. The company will help the government plan and implement a forest management plan to introduce the concept of sustainable forestry to the region. In addition, an off-site conservation plot of sensitive vegetation will be established to compensate for the irreversible damage done to vegetation on-site. Off-site, the planned offset projects total 7, 100 hectares of land which is four times the estimated 1, 700 hectares that will be affected by construction and operation. Furthermore, the EA outlines mitigation and relocation plans at the individual species level to account for potential harm to rare and endangered species on-site. Finally, the company has committed to continuous monitoring of the offset and mitigation projects and has developed a closure and reclamation plan.

Dynatec's monitoring and extensive assessment of the project site's ecosystems demonstrates the level of commitment required to create an adequate mitigation and offset plan. They have also accounted for timing of the offsets by planning offsets prior to commencement of the mine development. Currency issues have been taken into consideration resulting in a large ratio of conserved land to impacted land. The mixture of on-site and off-site conservation adds

legitimacy to the offset and the company's regard for both habitat as well as species-specific preservation increases compensatory accuracy

Dynatec expects to benefit in several ways from the implementation of biodiversity offsets. The company maintains a belief that "an outstanding commitment to sustainable development (…) and care for the environment is morally correct and is a sound business strategy that will provide (the company) with a secure "license to operate" and create value through reduced loss" (Dynatec Corporation Policy). The EA states that the Ambatovy project endorses the Equator Principles, principles that require biodiversity offsets, in order to gain access to funding from development banks (Dynatec 2006). Furthermore, during an information forum held by Dynatec, local community members expressed concerns regarding the mine's negative impacts on sensitive biodiversity, therefore the offsets will help the company gain community support for the mine. Over the thirty year lifespan of the mine, an average of 1, 700 to 2, 000 Malagasy labourers will be employed and the Malagasy government will receive an estimated $25 million annually in taxes and royalties. Due to the benefits made possible by the strong environmental strategy, Dynatec's Ambatovy mine not only takes responsibility for its negative environmental impacts, but will also provide extensive social and economic benefits to the local community.

Rio Tinto, Madagascar: Pre-development assessments and planning

Rio Tinto's subsidiary, QIT Madagascar Minerals (QMM) has spent the last 20 years assessing the impacts from mining in three mineral deposits along the coast near Fort Dauphin in Madagascar (Rio Tinto 2006). In 2004, Rio Tinto and QMM committed to the Net Positive Impact (NPI) policy. In July 2006, the company announced its intentions to use the Madagascar ilmenite site as its first official pilot project to help develop practices and methods to achieve a net positive impact on biodiversity. Over 20 years the mine site assessments have consisted of detailed biodiversity research, biological inventory studies, seed biology research, and conservation project development of three conservation regions within the forest. To carry out the assessments, QMM compiled a biodiversity team of Malagasy biologists and forest engineers, and began working with independent NGOs in 1998. In 2001 an independent biodiversity team was created to advise the local team on difficult issues like monitoring biodiversity, performance indicators and establishing biodiversity offsets on-site.

In 2007 Rio Tinto has plans to implement a new diagnostic tool at the mine site to define all the risks and opportunities that the project poses to biodiversity and prioritize the consequent actions needed. One local issue that the biodiversity team identified is the increasing degradation of forests due to local logging for fuel charcoal. In response to this discovery, the mining plan was adjusted to use fast growing trees for rehabilitation that will provide a fuel source and reduce the pressures of charcoal logging on the natural forests. The company will also establish conservation zones.

The rigorous offset planning prior to the mine's development demonstrates the company's interest in timing the compensation correctly. Furthermore, by directing loggers away from natural growth, the company can establish additionality for that portion of their offset scheme. Details like currency and scope of the offsets are still being finalized. Rio Tinto announced plans in 2006 to develop new mines in Australia and the United States using the same rigorous assessment process to determine how to maintain a net positive impact.

Rio Tinto explains that the company is already reaping the benefits from their good reputation for care of the environment. It claims that their strong environmental strategy is beginning to provide improved access to land as well as people and capital (Rio Tinto 2007). "The outcomes of these added benefits are beginning to differentiate us from our competitors and is helping us

move towards our goal of being the undisputed sector leader in maximizing value to stakeholders" (Rio Tinto 2007). These benefits are exemplified by the Fort Dauphin mineral project, a project that initially encountered protests from conservationists due to its sensitive location. As a result of the company's strong reputation and commitment to leaving a net positive impact, the project encountered no delays and is proceeding on schedule (Rio Tinto 2006).

Newmont Mining Corporation, Ghana: Partnership with a conservation organization

The Newmont Mining Company (2006) has begun to develop two gold mines in Ghana. The company formed a partnership with Conservation International to calculate baseline biodiversity data for the area and perform a risk assessment for both mines. In its Five Star integrated management program, the company plans to reclaim all impacted ground after the mine's closure; in addition, it has created an offset plan to compensate for the mine's effects while it remains in operation. The company has implemented a reforestation project that will rehabilitate two hectares of degraded land off-site for every hectare impacted by the mining process. Newmont has also engaged in the distribution of 112, 820 seedlings to local community members. While Newmont's environmental impact assessment efforts are commendable, the company's offset efforts lack the rigor required by offsetting criteria. The company provides minimal information regarding its biodiversity efforts. Finally, although the ratio is adequate, there is no mention of the company's currency calculations and baseline information about the impacted site that led to the decision to recreate forest. Newmont's CEO, Wayne Murdy, explains that by committing to sustainable development and by creating secure relationships with NGOs like Conservation International, the company's shareholders benefit directly (Murdy 2006). He also addresses the improved access to land, government and community attitudes that the company encounters due to the commitment to biodiversity offsets and other sustainable practices.

Anglo-American, South Africa: A creative offset proposal

In the company's sustainability report, Anglo-American states that it has been engaged in the development of new biodiversity offset programs internally and in collaborative group settings (Anglo-American 2006). The company plans to offset its PPRust platinum mine located in South Africa and has identified three areas within close proximity to the mine that would provide adequate compensation. The company plans to create a community-owned reserve that will provide local community members with income while they breed endangered species and upgrade the degraded portions of the land. The innovative concept of a community-owned reserve illustrates the flexibility and creativity that biodiversity offsets allow, however the project remains in the early stages of development and it remains to be seen whether a reserve in which community members hold accountability will succeed. Anglo-American's business strategy focuses on ensuring good relations with the communities surrounding the company's operations. By committing to the development and implementation of biodiversity offsets, the company gains the trust of local communities who will then support their business (Anglo-American 2006).

Bainbridge Real Estate, Washington, USA: Small development offsets

The City of Bainbridge Island in Washington State, USA has formed a partnership with the local Community Forestry Commission and BBOP in order to explore the concept of biodiversity offsets. The city is under increasing pressure to develop, so the project will explore how offsets work in a region where most land is of high development value (Washington Biodiversity Council 2006; BBOP 2007). Although minimal information was available concerning the project details, an urban developer in Winslow and a residential developer on forested land have both agreed to compensate for their impacts through biodiversity offsets (Washington Biodiversity

Council 2006). The establishment of offsets through small development companies is quite different from their implementation in large corporations, however in many areas, housing and building development present the greatest threat to the surrounding biodiversity. These companies will benefit in the same ways as the large corporations, through increased access to land, community support and regulatory approval (BBOP 2007).

Potential for Biodiversity Offsetting in Canada

Canada contains 20% of the world's wilderness, 24% of all wetlands, 20% of the global freshwater and 10% of the world's forests (Biodiversity Working Group 1994). Due to its expansive reserves of biodiversity and its increasing rate of industrial resource development, Canada represents a promising territory for biodiversity offsets. In 2005 an International Working Group met to discuss the most recent Convention on Biological Diversity and the potential for biodiversity offsets as a business tool. At the meeting, Canada, along with Brazil, proposed development of policy guidance on biodiversity offsets to aid businesses in the implementation process. Most Canadian companies studied in this paper lacked comprehensive biodiversity strategies to become biodiversity neutral or biodiversity positive. A no net loss policy is rarely explicitly stated and greenhouse gas compensation, adequate remediation and strong biodiversity compensation are often absent from companies' environmental portfolios. On the other hand, an overwhelming number of companies acknowledged a need to improve their biodiversity protection programs, and have implemented partial biodiversity strategies that include baseline information calculations, avoidance and rehabilitation. The future potential for biodiversity offsets in Canada seems promising and the obvious next step for many of the biodiversity conscious sectors is to move beyond compliance and establish a no net loss policy and create offset projects.

Inmet, a Toronto-based mining company, demonstrates extensive efforts to improve its environmental track record and minimize its environmental footprint. In its 2006 Sustainability Report, the company showed serious attempts to improve its environmental track record with 40 environmental incidents, a 30% decline from 2005. 2006 was the first year that the company had no notices of violation from authorities. In the report the company's main goal is to minimize its impact and take the appropriate steps to rehabilitate mines after closure (Inmet 2006). The company demonstrates a commitment to improve its performance and an acknowledgement of the benefits to doing so, however it does not clarify its position toward biodiversity management nor its commitment to preserving biodiversity.

The Newmont Mining Corporation of Canada Limited manages its air emissions and water contamination (Newmont 2006). The company creates rigorous mine site rehabilitation plans after closure, and completed a biodiversity risk assessment of 63% of its sites at the end of 2006. The company is developing a biodiversity policy and follows the ICMM's (2005) ten principles, one of which is to "contribute to the conservation of biodiversity and use an integrated land use planning approach". The Newmont Mining Corporation of Canada Limited is the partner company of Newmont Mining which has committed to the implementation of a BBOP offset pilot project. In its most recent Sustainability Report, the Canadian subsidiary explicitly states that it is "fully committed to exploring new innovative solutions to the challenge of sustainability". However, Newmont Canada has yet to demonstrate any obvious commitment to biodiversity preservation or any mention of offsets.

Several other Canadian corporations in the mining and oil and gas sectors demonstrate similar commitments to biodiversity protection as Inmet and Newmont. Inco (2006), a nickel mining company, is committed to rehabilitating all of its mines and is involved in extensive re-vegetation

programs. Suncor (2006), a Calgary-based oil and gas company, pledges to minimize impacts before it restores and rehabilitates sites, and the company has participated in conservation efforts in the Boreal forest. Barrick Gold Corporation (2005), based in Toronto, is committed to enhancing biodiversity, aims to minimize its footprint, mitigate its impacts and ultimately leave behind usable land. By the end of 2005 the company had reclaimed 14 000 hectares of 26 000 affected hectares. In 2005 Syncrude, an oil and gas corporation based in Alberta, reclaimed more land than it disturbed. However, the company has only rehabilitated 300 hectares of land while it has disturbed a total of 19 160 hectares. Teck Cominco Limited (2006) is a Vancouver-based mining company and a member of the International Council for Mining and Metals. It had a large share in the Compañía Minera Antamina project in Peru which has dabbled in biodiversity offsets. Teck Cominco engages in extensive reclamation, conservation and awareness projects. While these commitments to restoration are extensive, they are generally required of companies and so are not necessarily beyond compliance.

Presently, large Canadian resource corporations are not involved in the development of biodiversity offsets, although some are familiar with the concept. The most environmentally conscious companies are engaged in the preliminary steps required to allow for offset establishment. Of the companies considered in this review, many participate in baseline data reporting and follow the avoidance and minimization steps of the preferred action hierarchy. Furthermore, most demonstrate an interest in improving the management of their impacts to biodiversity. Several cannot rehabilitate their sites at a fast enough pace to keep up with their disturbance rates. At present, however, it is unclear whether their environmental management activities are simply in compliance with regulations and certification systems, or whether they are going above and beyond the required and expected stewardship activities. As the international popularity of biodiversity offsets increases, these Canadian corporations may be prepared to take the next steps, to adopt a ‘net zero impact’ policy and to compensate for their unavoidable residual impacts with rigorous compensatory projects, however, they have yet to demonstrate a commitment to eliminating their impacts entirely.

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