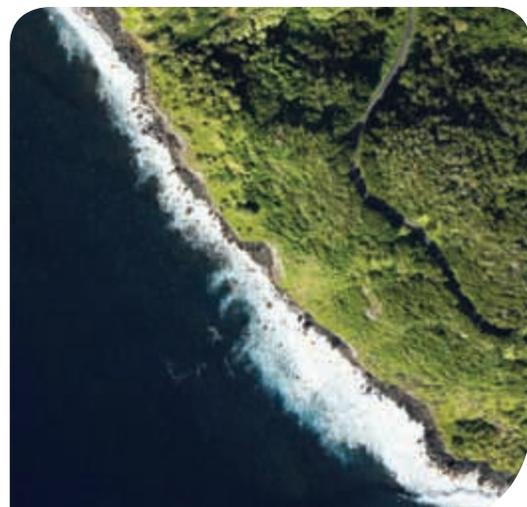
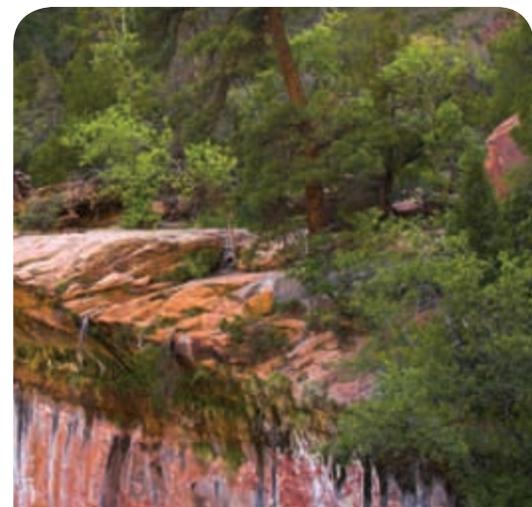
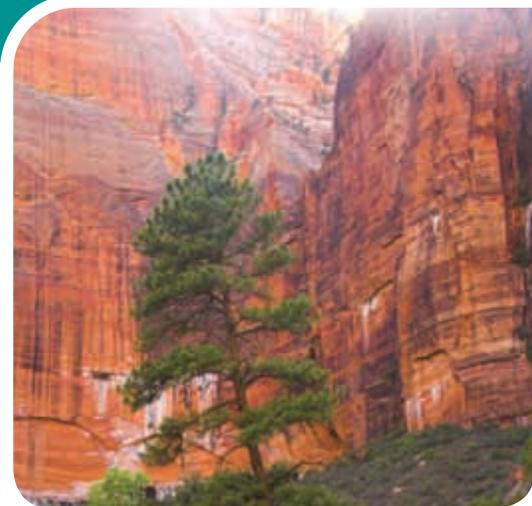


Business and Biodiversity Offsets Programme (BBOP)
Compensatory Conservation
Case Studies





Forest Trends, Conservation International and the Wildlife Conservation Society provided the Secretariat for BBOP during the first phase of the programme's work (2004 - 2008).

Publication Data

Business and Biodiversity Offsets Programme (BBOP). 2009. *Compensatory Conservation Case Studies*. BBOP, Washington, D.C.

Available from: www.forest-trends.org/biodiversityoffsetprogram/guidelines/non-bbop-case-studies.pdf.

© *Forest Trends* 2009.

ISBN 978-1-932928-37-2 (PDF)

Reproduction of this publication for educational or other non-commercial purposes is authorised without prior written permission from the copyright holder provided the source is fully acknowledged.

Reproduction of this publication for resale or other commercial purposes is prohibited without prior written permission of the copyright holder.

Cover and graphic design by Rima Design.

About this document

The Principles on Biodiversity Offsets and accompanying supporting materials¹ such as this set of case studies² have been prepared by the Business and Biodiversity Offsets Programme (BBOP) to help developers, conservation groups, communities, governments and financial institutions that wish to consider and develop best practice related to biodiversity offsets. They were developed by members of the BBOP Secretariat and Advisory Committee³ during the first phase of the programme's work (2004 – 2008) and have benefited from contributions and suggestions from many of the 200 people who registered on the BBOP consultation website and numerous others who have joined us for discussions in meetings.

The Advisory Committee members support the Principles and commend the other working documents to readers as a source of interim guidance on which to draw when considering, designing and implementing biodiversity offsets. Best practice in biodiversity offsets is still in its infancy, and the concepts and methodologies presented here need to be further discussed, developed, tested and refined based on more practical experience and broad debate within society.

All those involved in BBOP are grateful to the companies who volunteered pilot projects in this first phase of our work and for the support of the donors listed overleaf, who have enabled the Secretariat and Advisory Committee to prepare these documents.

BBOP is embarking on the next phase of its work, during which we hope to collaborate with more individuals and organisations around the world, to test and develop these and other approaches to biodiversity offsets more widely geographically and in more industry sectors. BBOP is a collaborative programme, and we welcome your involvement. To learn more about the programme and how to get involved please:

See: www.forest-trends.org/biodiversityoffsetprogram/

Contact: bbop@forest-trends.org

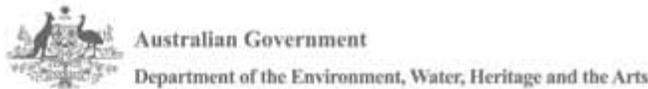
¹ The BBOP Principles, interim guidance and resource documents, including a glossary, can be found at: www.forest-trends.org/biodiversityoffsetprogram/guidelines/. To assist readers, a selection of terms with an entry in the BBOP Glossary has been highlighted thus: BIODIVERSITY OFFSETS. Users of the Web or CD-ROM version of this document can move their cursors over a glossary term to see the definition.

² This paper was prepared by Susie Brownlie.

³ The BBOP Advisory Committee currently comprises representatives from: Anglo American; Biodiversity Neutral Initiative; BirdLife International; Botanical Society of South Africa; Brazilian Biodiversity Fund (FUNBIO); Centre for Research-Information-Action for Development in Africa; City of Bainbridge Island, Washington; Conservation International; Department of Conservation New Zealand; Department of Sustainability & Environment, Government of Victoria, Australia; Ecoagriculture Partners; Fauna and Flora International; Forest Trends; Insight Investment; International Finance Corporation; International Institute of Environment and Development; IUCN, The International Union for the Conservation of Nature; KfW Bankengruppe; Ministry of Ecology, Energy, Sustainable Development, and Spatial Planning, France; Ministry of Housing, Spatial Planning and the Environment, The Netherlands; National Ecology Institute, Mexico; National Environmental Management Authority, Uganda; Newmont Mining Corporation; Private Agencies Collaborating Together (Pact); Rio Tinto; Royal Botanic Gardens, Kew; Shell International; Sherritt International Corporation; Sierra Gorda Biosphere Reserve, Mexico; Solid Energy, New Zealand; South African National Biodiversity Institute; Southern Rift Landowners Association, Kenya; The Nature Conservancy; Tulalip Tribes; United Nations Development Programme (Footprint Neutral Initiative); United States Fish and Wildlife Service; Wildlife Conservation Society; Wildlands, Inc.; WWF; Zoological Society of London; and the following independent consultants: Susie Brownlie; Jonathan Ekstrom; David Richards; Marc Stalmans; and Jo Treweek.

During Phase 1 of BBOP, the BBOP Secretariat was served by Forest Trends, Conservation International and the Wildlife Conservation Society.

We thank those organisations that have provided financial support for BBOP's work⁴: the Alcoa Foundation; Anglo American; City of Bainbridge Island, Washington, USA; Conservation International; Department for International Development, United Kingdom; Department of the Environment, Water, Heritage and the Arts, Australia; Forest Trends; International Finance Corporation; KfW Bankengruppe; Ministry of Housing, Spatial Planning and the Environment, The Netherlands; Newmont Mining Corporation; the Richard and Rhoda Goldman Fund; Rio Tinto; Shell International; Sherritt International Corporation; Solid Energy New Zealand; the Surdna Foundation; the United Nations Development Programme/Global Environment Facility; United States Agency for International Development⁵; and Wildlife Conservation Society.



⁴ Endorsement of some or all of the BBOP documents is not implied by financial support for BBOP's work.

⁵ This document is made possible in part by the generous support of the American people through the United States Agency for International Development (USAID). The contents are the responsibility of Forest Trends, Conservation International and the Wildlife Conservation Society and do not necessarily reflect the views of USAID or the United States Government.

Contents

This report summarises some compensatory conservation experiences that cover a broad range of circumstances and goals, and were for the large part not designed as BIODIVERSITY OFFSETS as defined in the BBOP PRINCIPLES. The case studies cover a variety of experiences: biodiversity offsets designed to achieve NET GAIN or NO NET LOSS of biodiversity; compensatory conservation measures, which provide some form of reparation for a project's negative impacts on biodiversity but may not reach no net loss; and other positive contributions to conservation that were not aimed specifically at compensating for residual negative impacts, but support biodiversity conservation in the area where the project took place. The report highlights some of the key issues and challenges encountered in designing and implementing compensatory conservation, and captures the lessons learned from each experience to inform future compensatory conservation initiatives, as well as biodiversity offsets.

Section 1 offers an introduction, and then Section 2 sets out a tabular description of the case studies covered. This is followed by some key findings from analysis of case studies (Section 3), some positive lessons from them (Section 4), and some reflections on emerging best practice and key challenges for the future (Section 5).

Table of contents

1.	Introduction	4
1.1	Introduction to the Business and Biodiversity Offsets Programme	4
1.2	Introduction to this Report	4
2.	Description of Case Studies	6
3.	Approaches and Issues in Determining and Implementing Compensatory Conservation Measures	12
4.	Positive Lessons from the Case Studies	14
5.	Emerging Best Practice and Key Challenges	25

1. Introduction

1.1. Introduction to the Business and Biodiversity Offsets Programme

The Business and Biodiversity Offsets Programme (BBOP) is a partnership between companies, governments, conservation experts and financial institutions that aim to explore whether, in the right circumstances, biodiversity offsets can help achieve better and more cost effective CONSERVATION OUTCOMES than normally occur in infrastructure development, while at the same time helping companies manage their risks, liabilities and costs. BBOP has been researching and developing best practice on biodiversity offsets and beginning to test it through a portfolio of pilot projects in a range of contexts and industry sectors, aiming to demonstrate improved and additional conservation and business outcomes. BBOP's expectation is that biodiversity offsets will become a standard part of the development process when projects have a significant RESIDUAL IMPACT on biodiversity, resulting in long term and globally significant conservation outcomes.

The Principles on Biodiversity Offsets and accompanying supporting materials such as this set of case studies have been prepared by BBOP to help developers, conservation groups, communities, governments and financial institutions that wish to consider and develop best practice biodiversity offsets.

1.2. Introduction to this Report

This paper offers a description and comparative analysis of existing experience in compensating for the residual negative impacts on biodiversity of projects from around the world.

Policy measures to compensate for projects' impacts on biodiversity, and voluntary best practice by companies around the world, have evolved considerably over the last few years. These COMPENSATION actions have been described variously as 'biodiversity offsets', 'compensatory mitigation', 'compensatory conservation', 'net conservation benefits' and 'environmental enhancement', among other terms.

In 2004, Insight Investment and IUCN interviewed some 50 representatives from companies, governments and conservation groups worldwide on these activities, and distilled from their understanding a definition of biodiversity offsets as 'Conservation actions intended to compensate for the residual, unavoidable harm to biodiversity caused by development projects, so as to ensure no net loss of biodiversity. Before DEVELOPERS contemplate offsets, they should have first sought to avoid and minimise harm to biodiversity'⁶.

Since then, BBOP has been exploring best practice on biodiversity offsets, and has defined biodiversity offsets as 'measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development'⁷ after appropriate prevention and MITIGATION measures have been taken. The goal of biodiversity offsets is to achieve no net loss and preferably a net gain of biodiversity on the ground with respect to species composition, HABITAT STRUCTURE,

⁶ ten Kate, K., Bishop, J. and Bayon, R. 2004. *Biodiversity Offsets: Views, Experience, and the Business Case*. IUCN, Gland, Switzerland and Cambridge, UK and Insight Investment, London, UK.

⁷ While biodiversity offsets are defined here in terms of specific development projects (such as a road or a mine), they could also be used to compensate for the broader effects of programmes and plans.

ECOSYSTEM FUNCTION and people's USE and CULTURAL VALUES associated with biodiversity⁸. This definition and level of precision in the consideration of biodiversity offsets is very recent. In practice, a range of experiences has accumulated in the last ten years, only some of which set out with the explicit goal of achieving 'no net loss' of biodiversity.

This report aims to discuss the full spectrum of compensatory conservation activities undertaken by companies in the context of particular development projects. It covers not only biodiversity offsets that achieve net gain or no net loss of biodiversity, as defined by BBOP, but also compensatory conservation measures, which provide some form of reparation for a project's negative impacts on biodiversity but may not reach no net loss. The report also embraces other positive contributions to conservation that were not aimed specifically at compensating for residual negative impacts, but support BIODIVERSITY CONSERVATION in the area where the project took place.

The conservation actions illustrated in the case studies were designed and implemented prior to and without recourse to BBOP's emerging principles, tools and guidance. For this reason, the term 'biodiversity offset' is not used in the report; rather, the generic term 'compensatory conservation' is used to refer to the spectrum of activities described above.

Measures to compensate for, counterbalance or offset residual negative impacts on the natural environment have increased in the past decade, as have efforts to make a positive contribution to biodiversity conservation. All of these measures reflect an increasing awareness of, and growing responsibility on the part of developers and regulators for, the unprecedented loss of biodiversity and the vital role of living systems in supporting sustainable development.

It is important to note that it is not the intention of the case studies to pass judgment on the various initiatives and efforts of project proponents or their development partners with regard to their compensatory conservation activities. The case studies cover a broad range of circumstances and goals, and were for the large part not designed as biodiversity offsets as defined by BBOP. The objective of the case studies is to explore a variety of experiences with the key issues and challenges encountered in designing and implementing compensatory conservation, and to capture the lessons learned from each experience to inform future compensatory conservation initiatives, as well as biodiversity offsets.

We hope that the case studies will be useful not only to BBOP in shaping its future work, but also to governments, industry, non-government and community-based organisations which are involved in the design or implementation of offsets.

⁸ The principles and additional supporting text can be found on the BBOP website at: www.forest-trends.org/biodiversityoffsetprogram/guidelines/overview.pdf.

2. Description of Case Studies

Eleven projects from around the world that involved some form of compensatory conservation were selected for description and analysis. In addition, one case study involved a positive contribution to conservation in the absence of significant residual negative impacts on biodiversity (Kumtor). Eight projects were chosen from developing countries, comprising two hydropower projects, one oil / gas project, a golf course / residential estate, a pulp paper mill project and three mining projects. Three cases from developed countries were chosen, comprising one mining project, one wind farm project and an under-sea electricity cable project.

In addition to these relatively detailed case studies, five less detailed descriptions have been included, since they offered interesting and potentially useful perspectives on offsets.

Table 1 summarises the case studies. For ease of referring to particular projects in the text that follows, a short reference name is given for each project in bold type (e.g. '**Antamina**' for the Antamina Copper and Zinc mine in Peru).

Table 1: Description of the case studies

Relatively detailed case studies – developing countries			
Project name	Project description	Offset, compensatory conservation or other contribution to biodiversity conservation	Approach to offset
<p>1. Chad-Cameroon Petroleum Development and Pipeline Project, Africa ('Chad Cameroon')</p> <p><i>[Esso Exploration and Production Chad, Inc, Petronas Carigali and Chevron Petroleum Chad Company Ltd]</i></p>	<p>An oil pipeline from three oilfields in Chad to the coast of Cameroon.</p>	<p>The Foundation for Environment and Development in Cameroon (FEDEC) was set up as an independent entity to provide financial assistance to 'environmental enhancement programme' activities in two areas of Cameroon (Mbam-Djerem and Campo) and to Bakola Pygmy-related development activities in the vicinity of the pipeline EASEMENT. The Cameroon Oil Transportation Company made an initial US\$3.5 million deposit to this fund, to be managed as an expendable endowment over a period of 28 years. Of this amount, US\$2.9 million was to be used for managing the two protected areas.</p> <p>The protected areas amount to about 690,000 ha. It was estimated that less than 10,000 ha would be impacted by the project.</p>	<p>Two 'environmental enhancement programme' areas were selected as targets for protection and management funding as compensation.</p> <p>Areas for conservation activities were selected using a number of criteria: their high conservation priority and / or existing protected area status, the fact that they contained habitat similar to that affected by the pipeline project, had potential to link with existing protected areas, were close to the impacted site, had use objectives compatible with conservation, and would not necessitate the resettlement of communities. The areas selected for conservation activities were considered to be under severe threat from ongoing transformation through logging, overexploitation of wildlife, and growing settlements.</p> <p>The residual negative impacts of the project on biodiversity were not quantified or used explicitly to inform the selection and area of the sites selected for the conservation activities.</p>
<p>2. Bujagali Energy Limited: Hydropower project and transmission line, Uganda, Africa ('Bujagali')</p> <p><i>[AES Nile Power Ltd. initially, now Bujagali Energy Limited as Uganda Electricity Transmission Company Limited's Authorised Agent]</i></p>	<p>A hydropower plant on the Victoria Nile, and associated electricity transmission line.</p>	<p>The impact on the Bujagali Falls and Jinja Wildlife Sanctuary would be compensated by enhanced protection of the Kalagala Falls and Nile Bank Forest Reserves, with tree planting in disturbed areas.</p> <p>Loss of forest habitat and associated biodiversity in Mabira would be compensated by monies equivalent to the Total Economic Value of lost forest resources, allocated to support initiatives by the National Forestry Agency. Communities would receive 'compensatory benefits' for lost biodiversity related LIVELIHOODS.</p> <p>Approximately 70 ha of three Central Forest Reserves (CFRs) would be converted by the transmission line component of the project. In the initial impact assessment, two properties of 234 ha and 162 ha next to Mabira CFR were evaluated as a potential offset for these impacts.</p>	<p>BASELINE STUDIES focused on species. The evaluation of potential compensatory conservation measures involved the consideration of social, economic and conservation values of affected natural areas.</p> <p>To compensate for impacts of the hydropower facility on the Bujagali Falls and nearby Jinja Wildlife Sanctuary, the Kalagala Falls area and contiguous smaller forest reserves were identified in both the 2001 and 2006 impact assessments as being "appropriate for maintaining an ecologically similar protected area"⁹.</p> <p>HABITAT TYPE and condition, land use and proximity to the impacted area were the key criteria used to compare options for compensating the impacts on the Mabira CFR in the 2001 study. No explicit loss-gain measures were used.</p> <p>In the later 2006 study, the 'on the ground' actions to compensate for impacts on the three CFRs were not considered further. Rather, the value of biodiversity (primarily related to use value) was converted to monetary values and compensation was paid to the department responsible for managing protected areas.</p>

⁹ Bujagali Energy Limited, Bujagali Hydropower Project Social and Environmental Assessment. Main Report December 2006.

Relatively detailed case studies – developing countries			
Project name	Project description	Offset, compensatory conservation or other contribution to biodiversity conservation	Approach to offset
<p>3. Mount Royal Golf Estate, South Africa, Africa ('Mount Royal')</p> <p><i>[Proprop Trust, Swartland Municipality]</i></p>	<p>Golf course with associated residential, commercial and tourism components partly on private and partly on State land, Western Cape province.</p>	<p>On-site protection of 17.34 ha of good quality vegetation, plus the establishment of a Trust Fund to contribute to effective management of the on-site conservation area plus 300 ha of State-owned land off-site (3 parcels) with the same vegetation type, but which has been (10 –15%) invaded by alien plants. The developer was to contribute R1.5 million (approximately US\$300,000 at the time of authorisation) to the Trust Fund. This amount was decided on the basis of anticipated costs of managing the conservation areas.</p> <p>The project would have an impact on about 50 ha of previously disturbed and thus relatively low quality vegetation.</p>	<p>Baseline studies looked at vegetation type and plant species. The evaluation of impacts on biodiversity and potential compensatory conservation focused on the contribution of the threatened and regionally ENDEMIC vegetation type to meeting regional and national conservation targets. There was no explicit quantification of BIODIVERSITY LOSS or GAIN. Faunal species were not taken into account.</p>
<p>4. Pulp United Pulp Mill, South Africa, Africa ('Pulp United')</p> <p><i>[Pulp United (Pty) Limited, a subsidiary of NCT Forestry Co-operative Limited, with uMhlatuze Municipality]</i></p>	<p>A bleached chemi thermo mechanical pulp mill on land within an Industrial Development Zone, KwaZulu-Natal province.</p>	<p>Restoration of the same vegetation type within the municipal area at a ratio of 10 ha for every 1 ha impacted, the setting aside of three priority areas for nature conservation as formal protected areas, and the protection from development of remaining areas of this vegetation type within the municipality. The relocation of KwaMbonambi Grassland, although seen as the minimising of impacts, was included as part of the compensatory conservation package.</p> <p>An estimated 8 ha of habitat would be impacted by the proposed development.</p>	<p>Baseline studies focused on vegetation type and broad habitat. The area of impacted habitat was used as the basis for determining the compensatory conservation (i.e. hectares), and a 10:1 ratio applied.</p>
<p>5. Antamina Copper and Zinc Mine, Peru, South America ('Antamina')</p> <p><i>[Compañía Minera Antamina]</i></p>	<p>Copper and zinc mine in the Ancash Department of Peru.</p>	<p>A voluntary <i>Polylepis</i> planting and conservation programme involving local communities and non-government organisations.</p> <p>An estimated 1 ha of <i>Polylepis</i> forest, and 220 ha of forest and grassland ecosystem, was converted by the mine.</p>	<p>The programme aimed to restore areas of <i>Polylepis</i> forest as a proxy to maintaining highland ecosystems, measured in hectares conserved and restored. It also aimed to improve livelihoods, as measured by increases in income, reduced demand for fuelwood, and improvements in health. Since the purpose of the initiative was not to compensate for residual loss from development, no quantification of loss-gain was undertaken. Also, since the value of ecosystems other than <i>Polylepis</i> forest was considered low at the time of the EIA (1998), no compensation for impacts on these other ecosystems (e.g. highland grassland) was considered.</p>

Relatively detailed case studies – developing countries			
Project name	Project description	Offset, compensatory conservation or other contribution to biodiversity conservation	Approach to offset
<p>6. Nam Theun 2 Hydropower Project, Lao People's Democratic Republic, Asia ('NT2')</p> <p><i>[Nam Theun 2 Power Company]</i></p>	<p>A trans-basin hydropower facility in the Khammouane and Bolikhamxay provinces, central Lao PDR.</p>	<p>The company will contribute a total of US\$31.5 million (US\$6.6 million up front, US\$1 million per annum thereafter) to the Watershed Management and Protection Authority, a government organisation. The funds are to be used for the management and conservation of the Nakai-Nam Theun Biodiversity Conservation Area (NBCA) and two associated corridor areas (a total of 393,618 ha), and for sustainable livelihood development opportunities for the estimated 5,700 villagers living in the area.</p> <p>An estimated 98,020 ha of habitat would be directly impacted and 32,568 ha indirectly impacted by the project.</p>	<p>A Natural Habitats Accounting approach was applied to the impact and compensatory conservation area, after the latter area had been selected.</p> <p>This approach quantified the hectares and quality of each habitat type directly impacted by the project, and evaluated the significance of habitat in terms of either its national or sub-national conservation value. The area of each habitat type lost as a result of the development was then compared with the area of each habitat type in the existing Nakai Nam Theun Biodiversity Conservation Area (NBCA), to determine the extent to which habitats 'lost' would be represented within the NBCA.</p>
<p>7. Kumtor Gold Mine, Kyrgyzstan ('Kumtor')</p> <p><i>[Kumtor Gold Company]</i></p>	<p>An open pit gold mine in the Issyk Kul Province of Kyrgyzstan.</p>	<p>The proposed mining project catalysed the establishment of the Sary-Chat Ertash Zapovednik nature reserve by government. A Community Business Forum was established which managed a small grants programme to benefit local communities and conservation. A biodiversity project aimed at improving management of the Sary-Chat Ertash Zapovednik nature reserve and conservation of significant species such as the Snow Leopard, Ibex and Marco Polo sheep, with simultaneous benefits to local community livelihoods, was also started.</p>	<p>The proposed mine would not have significant residual adverse impacts on biodiversity, according to the Environmental Assessment report. The mine's contribution to biodiversity conservation was thus not linked either to offsetting or providing compensation for residual negative impacts of the proposed mining operation, and was not quantified or measured. Decisions on making a contribution to conservation were informed by the Community Business Forum (CBF) and associated international NGOs.</p>
<p>8. Brisas Gold and Copper Project, Venezuela ('Brisas')</p> <p><i>[Gold Reserve Inc.]</i></p>	<p>An open pit mine in Eastern Venezuela's Oronoco River basin.</p>	<p>A portfolio of compensatory conservation activities comprising the creation and expansion of a protected buffer zone adjacent to the Canaima National Park upstream of the Brisas mine site, tree-planting, a number of agro-forestry and ECOTOURISM projects based on traditional livelihoods, and the establishment of a biodiversity research station.</p> <p>The total footprint of the mining area is about 3,100 ha of mainly forest habitat within the Imataca Forest Reserve. The mine site is located in a landscape impacted by artisanal and small-scale mining. Biodiversity information was gathered and evaluated within a regional and landscape context.</p>	<p>Areas were selected for conservation activities using the following criteria:</p> <ul style="list-style-type: none"> • Equivalent or comparable biodiversity; • Expected support for the offset by key STAKEHOLDERS; • Likely sustainability of the offset; and • Opportunities for partnerships. <p>A range of possible options was considered, from rehabilitation, assistance with sustainable agro-forestry, to more conventional measures aimed at strengthening existing pristine or protected areas.</p>

Relatively detailed case studies – developed countries			
Project name	Project description	Offset, compensatory conservation or other contribution to biodiversity conservation	Approach to offset
9. Kennecott Utah Copper Mine, North America (‘Kennecott’) <i>[Kennecott Utah Copper Corporation]</i>	Expansion of the tailings area of a copper mine, Utah.	An area of 1,011 ha less than 1 km from the project site was restored as wetland habitat; the so-called Inland Sea Shorebird Reserve. This area comprised a Mitigation Site and a Bank component to compensate for future impacts on wetlands in the catchment. About 427 ha were impacted by the tailings expansion.	A Habitats Evaluation Procedure, using a Habitat Suitability Index model, was used to determine the number of Habitat Units for different species at both the impacted and mitigation sites. In discussion with the relevant authority, it was determined that a 1:1 ratio of Habitat Units of ‘mitigation wetland’ to impacted wetland, would be required; in this instance the ratio coincided with a 1:1 ha ratio. The mitigation site required was 427 ha, the same size as the impacted area.
10. Apennine Wind Farms, Italy, Europe (‘Apennine’) <i>[Anemen Srl, Ferrara, and Elettromeccanica Adriatica Spa, Ascoli Piceno]</i>	Two wind farms in the province of Macerata, Apennine Mountains.	Restoration of unused and degraded agriculture areas within the Natura 2000 site to compensate for loss of grassland habitat, exclusion of human hunting from an area commensurate with that lost to raptors through the development, burial of an existing electricity transmission line to reduce risks of bird collisions.	Baseline studies were carried out on the affected habitat. Biological Territorial Capacity (BTC) indices and ecological energy balance considerations were used to determine residual negative impacts on priority grassland habitat, on raptors, bats and other important bird species.
11. Basslink Under-sea Power Cable, Australia (‘Basslink’) <i>[Basslink Pty Ltd]</i>	An electricity cable linking Tasmania with the Victoria State of mainland Australia.	The proponent purchased property having similar albeit degraded vegetation adjacent to the main impact site of the project, for restoration, maintenance and improvement of habitat. The impacted site was within the Special Protection Zone of a State Forest.	The HABITAT HECTARES approach was used, as advocated in the draft Framework for Action for conserving native vegetation in the Victoria state, whereby the type, quality and conservation significance of impacted vegetation was initially determined. These initial amounts of habitat hectares were combined with an additional MULTIPLIER to address risk and other factors, to indicate the total number of habitat hectares needed to compensate for the impact. The same approach was then used to identify the management actions and area that would yield a sufficient amount of improvement to compensate for the habitat hectares of impacted vegetation.

Additional projects			
Project name	Project description	Offset	Approach
1. Manaus Energia, Balbina Hydropower Plant, Brazil, South America ('Balbina') <i>[Eletronorte]</i>	Hydropower plant, Brazilian Amazonia, Brazil.	Creation of the Uatumã Biological Reserve; Brazil's largest federal biological reserve.	Joint initiative of the Brazilian Institute of Environment and Renewable Natural Resources (IBAMA) and Eletronorte, to conserve habitat around the Balbina reservoir. The developer reached an accord with IBAMA to provide annual financial and logistical support for the Uatumã Biological Reserve over a specified time period.
2. Jonah Natural Gas Field, North America ('Jonah') <i>[BP America Production Co.]</i>	Development of a major gas field, Wyoming.	Systematic conservation planning exercise to make best use of a compensation fund established for the project.	Partnership between the Nature Conservancy's Goal-setting Project and BP. The Nature Conservancy prepared a GIS-based tool to inform the selection of priority areas for conservation to ensure persistence of affected species and habitats in the area surrounding the Jonah site. Project proposals within these areas will be considered for grants from the compensation fund established.
3. CEMEX EI Carmen Wilderness Area ('CEMEX') <i>[CEMEX]</i>	Establishment of a wilderness area, Mexico-USA border.	At the suggestion of a Mexican NGO, CEMEX (a Mexican cement corporation) purchased extensive tracts of land and entered into conservation agreements with private landowners in order to translate a long-recognised need for conservation of a 'mega corridor' area into reality on the ground.	Partnership between CEMEX, Agrupación Sierra Madre (a non-government organisation) and the national commission for protected areas (government body), guided by an advisory panel.
4. QMM mine and port, Madagascar, Africa ('QMM') <i>[QIT Madagascar Minerals]</i>	Heavy mineral sands mine and port, Anosy region.	On- and off-site conservation of littoral forest, plus a range of livelihood initiatives. Expansion of the protected area system in Madagascar through conservation of priority sites and alleviation of pressure on important biodiversity for livelihoods.	Comprehensive baseline studies, the advice of a panel of experts, and an integrated approach to social, cultural and environmental issues has resulted in a composite programme of compensatory conservation activities.
5. Rhenish-Westphalian Water Supply Company, Germany, Europe ('Rhenish-Westphalian') <i>[Rhenish-Westphalian Water Supply Company]</i>	Compensation pool of restored habitat, Ruhr Valley, Germany.	Restoration of the Lippe River Floodplain, a special natural landscape unit. The pool acts as a CONSERVATION BANK.	Comprehensive restoration and the establishment of a compensation pool of that restored habitat as a bank; trading in terms of compensation credit points related to habitat value and area.

3. Approaches and Issues in Determining and Implementing Compensatory Conservation Measures

The key findings of the analysis of case studies can be summarised as follows:

- All of the compensatory conservation activities would benefit biodiversity and are highly unlikely to have taken place in the projects' absence.
- Their objectives varied from an explicitly required 'net gain for native vegetation' (Basslink), and 'no net loss' (Kennecott, Pulp United), to 'full compensation' (Apennine), 'compensation' (Bujagali, NT2) to making a 'positive contribution' to biodiversity conservation (Antamina). Having explicit objectives and clear outcomes for the activities was emphasised as critical to their success (e.g. Kennecott).
- The triggers for considering compensatory conservation ranged from a specific legal requirement (US Clean Water Act permit: Kennecott; European Community Birds and Habitats Directive, and national law: Apennine), draft state policy (Victoria's Native Vegetation Management, A Framework for Action: Basslink), the requirement of a provincial conservation agency (Pulp United), the policies and operational directives of international financing institutions (World Bank Operational Policy 4.04 on Natural Habitats: Chad Cameroon, Bujagali and NT2), corporate policy (Antamina), the motivation of a botanical specialist (Mount Royal), to an intention on the part of project funders and the proponent to make a positive contribution to conservation (Kumtor).
- All of the case studies considered impacts on species and broad vegetation types or habitats in selecting the conservation areas and activities. Most case studies took into account project impacts within the broader landscape. Five of the case studies considered biodiversity based LIVELIHOODS, either as part of compensatory conservation or separately as part of social compensation. One case study in particular touched on the spiritual value of the affected biodiversity (Bujagali), and one (Antamina) was principally designed to uplift local communities whilst simultaneously benefiting the restoration of landscape links and important habitat.
- Four of the case studies used a systematic and explicit quantitative approach to measuring biodiversity losses at the IMPACT SITE against GAINS at the compensation sites, with various levels of complexity (NT2, Kennecott, Apennine, Basslink). All of these approaches focused on the INTRINSIC VALUES of biodiversity. In three of these four cases, the desired outcome for the compensatory conservation was clearly defined, namely 'net gain' (Basslink), 'no net loss' (Kennecott) or 'full compensation' (Apennine). The other case studies (except Kumtor) used broad EXCHANGE CRITERIA: mainly similar habitat, an area known to be a priority for conservation, and proximity to the impact area. Six of the case studies considered ALTERNATIVES to a greater or lesser extent before selecting the final conservation sites and activities.

- In a number of cases, raised awareness of biodiversity issues amongst stakeholders was identified as an unexpected benefit of interactions with government and communities through the process of planning compensatory conservation measures (e.g. Mount Royal, Kennecott, Kumtor).
- The conservation actions in all cases targeted similar vegetation types / habitat to those impacted, located close to the impact site. Many of the case studies comprised the funding of conservation management of areas recognised both as priorities for BIODIVERSITY CONSERVATION and as vulnerable to anthropogenic pressure. Some of these areas have been given formal protection; for the others, long-term protection is planned. The case studies include, to a greater or lesser extent, some re-planting or restoration of disturbed or degraded areas that would benefit biodiversity. The creation of linkages between (e.g. Antamina, Pulp United and NT2), and / or consolidation of (e.g. Kennecott, Basslink), protected areas or areas of high conservation value were strong considerations in selecting the areas and activities in some cases. The emphasis of three case studies (Antamina, Kennecott and the Apennine) is on recreating or restoring impacted habitat, combined with the long-term intention of formal protection of these habitats.
- Where existing natural areas were set aside as conservation areas, their effective management by parties with a clear and long term vested interest in their conservation, and securing their legal status as protected areas, were seen to be of the utmost importance for the compensatory conservation measures to succeed.
- Biodiversity strategies are expected to demonstrate the company's commitment to responsible development and give confidence to both stakeholders and investors (e.g. Brisas). From the case studies, the benefits of compensatory conservation to a developer or company range from securing an improved project (e.g. Mount Royal), to improved relationships and easier dealings with authorities, to building on track record and credentials (e.g. Kennecott).
- The importance of providing financial security to manage compensatory conservation areas has been raised in a number of instances (e.g. Antamina, Brisas). Problems with insufficient financing and lack of capacity to implement compensatory conservation are being experienced in a number of case studies (e.g. Chad Cameroon). These case studies highlight the need for careful planning of ways to finance compensatory conservation activities: it is important to ensure that there is a high degree of confidence in order to deliver the right quantum of money as and when needed over time, and to meet the costs of acquiring or building the capacity needed to ensure effective implementation.

4. Positive Lessons from the Case Studies

Ten lessons illustrating emerging good practice are drawn from the case studies (see Box 1).

Box 1: Ten lessons from the case studies

- a) Be clear about what you're trying to achieve.
- b) Know your ecosystems and the landscape context.
- c) Understand communities' needs and work with them.
- d) Choose an appropriate approach.
- e) Know that you can deliver.
- f) Bridge barriers between different disciplines and cultures.
- g) Collaborate and communicate openly.
- h) Be cautious.
- i) Think ahead and long term.
- j) Consider going beyond 'no net loss'.

Each lesson is discussed briefly in a separate section below, drawing on relevant case studies. Each case study is referred to by using the short reference name for that project given in Table 1.

a) Be clear about what you're trying to achieve

Explicitly defined objectives or desired outcomes for biodiversity conservation are important to give direction and act as a yardstick against which to measure the success of compensatory conservation activities or BIODIVERSITY OFFSETS. From the examples below, it is clear that the objectives vary from a 'no net loss' outcome to compensatory conservation in the NT2 hydropower project in Laos, to a positive contribution to biodiversity conservation in the region in the case of Kumtor, Kyrgyzstan.

Box 2: Be clear about what you're trying to achieve

Kennecott

- The objective was to achieve 'no net loss' of wetland function as specified in U.S. law.
- Deciding on, and articulating, clear objectives and goals of the conservation activities up-front were critical to their success. As a first step in this process, deciding on the ecosystem values and functions that would be impacted by the tailings expansion was a key challenge for Kennecott in determining commensurate compensatory mitigation. Once these values and functions had been identified, the next challenge was to define the primary objectives and goals of the offset, teasing out which important ECOSYSTEM SERVICES would be restored.

Basslink

- The objective was to achieve a ‘net gain’ for native vegetation.
- Use of the habitat hectares approach with its systematic methodology provided an explicit, transparent, quantitative and defensible approach to determining compensatory conservation measures commensurate with the loss of biodiversity.

Apennine

- The objective was to achieve full compensation for residual negative impacts on biodiversity.
- Use of the Biological Territorial Capacity and an Energy Accounting methodology enabled quantification of losses to biodiversity and calculation of offset gains required

b) Know your ecosystems and the landscape context

The importance of understanding the biodiversity that would be lost as a result of the proposed development, the values of impacted biodiversity and the associated significance of its loss, is underlined in a number of case studies. In addition, an understanding of the bigger LANDSCAPE CONTEXT of both the impacts and possible compensatory conservation activities helps to locate these activities optimally.

Box 3: Know your ecosystems and the landscape context**Basslink**

- All Ecological Vegetation Classes in Victoria State have been given a bioregional conservation or threatened rating. This classification facilitates the evaluation of residual negative impacts and application of the habitat hectares approach to determining compensation required in Victoria State.
- The compensation sites were located in the landscape to consolidate conservation areas, and increase their long-term security. It was within the same bioregion and landscape as the ecosystems where the majority of losses would occur, and augments the Special Protection Zone of the Mullungdung State Forest.

Mount Royal

- The conservation status of the affected vegetation at a national level was known at the time of the project: the target for conserving this vegetation type ‘Swartland Granite Renosterveld’ is 26% of the original extent; at the time of the project, 0.6% was protected. This vegetation type is now recognised as being Critically Endangered on a national basis.
- The intention of the development and associated compensatory conservation was to trade impacts on a small area of relatively low quality habitat with activities to safeguard a far larger area of good quality priority habitat in the long term, in an effort to meet conservation targets.

NT2

- A Natural Habitats Accounting approach was used to determine and assess the significance of project impacts on biodiversity and evaluate the proposed compensatory conservation in relation to the impacts. The approach involved identifying the major HABITAT TYPES in the project area and assessing the extent to which these habitats would be converted, degraded or conserved as a result of the project. The significance of degradation was described in terms of quality and ECOSYSTEM FUNCTION of each habitat type, and the relative area at both national and regional levels. The approach incorporated

an analysis of the degradation and conversion expected in the protected areas and its significance to species of conservation importance.

- The resulting conservation activities contributed to the improved management of the Nakai Nam Theun Biodiversity Conservation Area, recognised as a cornerstone for the bigger system of protected areas in the region and linking to protected areas in Vietnam.

Jonah

- The Nature Conservancy's 'goal setting' project funded by BP America Production Co. underlines the value of knowing the conservation importance of different habitats that could be impacted, as well as their functional relationship in a larger, landscape context, in focusing a company's conservation and development efforts.
- This approach can highlight 'up front' where it is possible to compensate for impacts, and where compensation would not be possible. The project proposed a framework for site selection that involved the development of goals to meet the conservation needs of potentially impacted biological targets (one ecosystem and nine chosen species). Next, a site-selection algorithm developed for Marxan was used to search for suitable sites at increasing spatial extents.

Antamina

- The *Polylepis* programme started as an initiative focused on the conservation of Peruvian highland ecosystems using the restoration of a particular genus of tree as the main strategy to promote the conservation of a corridor that is a composite of landscapes including forests and highland grasslands. However, the benefits of the programme translate into benefits for that whole forest ecosystem, including important highland birdlife, and for the regional conservation landscape.
- The Asociación de Conservación de los Ecosistemas Andinos prepared a biological inventory of the areas where *Polylepis* were present and the sub-species that were in those forests, and made recommendations as to areas that required attention in terms of protection, as well as the areas that could serve as seeders for the proposed restoration sites. The long-term intention is that the *Polylepis* programme will contribute to the development of a conservation corridor linking two protected areas, namely Huascarán National Park and the Huayhuash Reserve.

Pulp United

- The provincial conservation agency and the local municipality made a joint commitment to the development of a network of protected areas linking inland reserves to coastal ecosystems, to secure representative samples of the biodiversity existing within the Municipal area, in order to compensate for the negative impacts of developing a site which comprised Critically Endangered grasslands and wetlands.

c) Understand communities' needs and work with them

In rural areas of developing countries, in particular, development frequently has an impact on communities that are heavily dependent on natural resources for their LIVELIHOODS. Understanding the socioeconomic and cultural context is thus recognised in a number of case studies to be as important for understanding the affected biodiversity when designing and implementing compensatory conservation measures.

Box 4: Understand communities' needs and work with them

Antamina

- Linking BIODIVERSITY CONSERVATION to improving quality of life for local communities was recognised as important. The programme benefits local communities primarily by providing an alternative form of economic activity, by helping to provide sustainably sourced fuelwood while simultaneously reducing demand for unsustainably sourced fuelwood, with health spin-offs. Benefits described in the conservation agreements with communities include introducing more fuel-efficient stoves, managing improved pastures and introducing improved breeds of cattle and sheep. An estimated 20 local communities could benefit from the programme.
- It was recognised that the long-term sustainability of the conservation outcomes rests on the creation of a trust fund that will support the provision of socioeconomic benefits to the communities in exchange for their long-term commitment to conservation.
- It was thus considered crucial to take the time necessary to understand the complex legal, social, cultural, economic, governance and ecological circumstances prevailing in the area prior to designing and locating conservation activities and determining an optimum strategy for their effective implementation. One important criterion for successful management was to demonstrate tangible benefits to local communities in the short term. This case also highlighted the fact that non-material cultural values of the communities involved may be important in the design of conservation agreements.

NT2

- The objective was to conserve and promote biological diversity, and develop sustainable livelihoods for affected communities.
- The project involves re-settlement of villages and the introduction of new livelihoods: a choice of livelihood options includes agriculture, fisheries, commercial forestry or livestock husbandry. Losses to downstream fisheries on the affected river system will be compensated, and a programme initiated to establish sustainable management of stream fisheries in conjunction with villagers.
- The case study emphasises the importance of allowing a long lead time in introducing alternative or new livelihoods to reduce pressure on biodiversity; encouraging new habits and occupations takes time.

QMM

- QMM's Integrated Compensation Programme recognises the close interdependencies between biodiversity conservation and livelihoods, and the need to ensure an integrated approach to social, cultural and environmental issues. It is also recognised that environmental programmes must try to meet the needs of the local communities.
- The mineral deposits lie beneath some of the last remnants of littoral forest in southeast Madagascar. These forests are a valuable resource for local communities who depend on the wood for fuel and building material, but their use is unsustainable: without any new planting of fast-growing species, and given current depletion rates, the remaining forest would be destroyed within the next 20 – 40 years. The programme recognised the need to address this problem by planting fast-growing exotic trees and establishing nurseries, and by protecting priority areas of this forest type.

d) Choose an appropriate approach

The objective or desired outcome of the activities, budgets, timeframes, information needs and the availability of information, as well as the specific socioeconomic context of the project site, influence the choice of approach to compensatory conservation. Some case studies used broad criteria to determine the nature and extent of conservation activities needed (e.g. Chad Cameroon), some used prescribed and quantitative approaches (e.g. Basslink), and some adapted existing approaches to meet the needs of the project (e.g. Kennecott). In some cases the focus is on the intrinsic value of biodiversity (e.g. Basslink, Mount Royal, Pulp United and Kennecott), whilst in others (e.g. QMM, NT2) the use and / or cultural values of biodiversity are also addressed.

Box 5: Choose an appropriate approach

Chad Cameroon

- Conservation areas were selected based on a number of transparent criteria, namely: their high conservation priority; the fact that they contained habitat similar to that affected by the project; they had potential to link existing protected areas; they were close to the impacted site; they were under severe threat from ongoing transformation through logging, overexploitation of wildlife, and growing settlements; they had land or resource use objectives compatible with conservation; and there would not be a need to resettle communities.

Brisas

- Areas were selected for conservation activities based on the following criteria: their having equivalent or comparable biodiversity to that impacted by the proposed mine; anticipated support for conservation by key STAKEHOLDERS; the likelihood that the compensatory conservation area would endure; and, opportunities for partnerships in implementing and managing conservation activities.

Antamina

- The programme aims to contribute to the development of a conservation corridor linking two protected areas. The corridor is almost entirely owned by communities, necessitating their collaborative engagement. The programme is negotiating formal conservation agreements with targeted local communities. These agreements go beyond the areas to be restored through planting and incorporate large tracts of highland Andean Ecosystem.
- Being able to demonstrate tangible benefits of the offset to local communities in the short term is an important success factor. Negotiations were held with communities to identify the OPPORTUNITY COSTS of the conservation activities and to derive sufficient and acceptable compensation, as well as to obtain formal buy-in to conservation management.
- In this programme, these tangible benefits have ensured that people who have signed conservation agreements stick to their commitments, and those that haven't participated in the programme are attracted to the process. The design of conservation agreements, to protect biodiversity in the long term, is thus recognised as critical: these agreements must represent the right balance between economic and other incentives identified locally, and local pride in stewardship.

Kennecott

- Rather than using the usual 'vegetation, soils and hydrology' criteria typically applied in wetland restoration at the time, the company decided to focus on restoring habitat for shorebirds, and to find appropriate CURRENCY to determine replacement values. Achieving a shift in the current mindset from 'using set parameters', to thinking about 'ecological function', took considerable discussion.

- The Technical Advisory Group felt that a HABITAT EVALUATION PROCEDURE (HEP) would provide a sound basis for determining the requirement for replacement of habitat function and value to wildlife. Three different HEP models were used to determine the size of offset: the American Avocet model for nesting shorebirds; the Migratory Shorebirds model for shorebirds that used the wetland for feeding and roosting; and the Cinnamon Teal model for ‘dabbling ducks’.

QMM

- A compensatory conservation programme comprising more than one initiative is planned, involving separate sites in and around the Anosy region of Madagascar. The intention is to set aside the 40,000 ha Tsitongambarika area for biodiversity conservation, establish a forest planting programme and associated nurseries, and finance a number of other community projects linked to natural resource management including bee-keeping, agriculture, handicrafts and weaving, fishing, and the development of local nature tourism circuits.

NT2, Chad Cameroon, Pulp United and Kumtor

These projects responded to the lack of capacity and / or resources needed for effective management of priority areas for biodiversity or protected areas.

- Without the NT2 Project in Laos the Nakai Nam Theun Biodiversity Conservation Area ‘would have no future as an intact Protected Area’.
- The Chad Cameroon project targeted the conservation and management of two areas of Cameroon (Mbam-Djerem and Campo) in the vicinity of the pipeline EASEMENT.
- The Pulp United project in South Africa aimed to set aside and manage three priority areas for nature conservation as formal protected areas.
- The Kumtor Mine, Kyrgyzstan, catalysed the declaration of the Sary-Chat Ertash Zapovednik nature reserve and funded a project to improve its management.

e) Know that you can deliver

A number of the case studies have made provision for securing legal protection of priority conservation areas, funds, management, and / or capacity to manage their conservation projects for the long term.

Box 6: Know that you can deliver

Chad Cameroon

- A Foundation for Environment and Development in Cameroon (FEDEC) was set up as an independent entity to provide financial assistance in the long-term to the two conservation areas and social upliftment projects. A breakdown of projected costs of setting up defined programme activities, and supporting them on an annual basis was undertaken to inform the size of the developer’s contribution to FEDEC. Although additional financial assistance was to be sourced from the Government and other donors, the initial capitalisation was inadequate to meet the actual costs of implementing the offset.

NT2

- The developer contributed a lump sum ‘up-front’ and an annual amount thereafter for approximately 31 years (the operating life of the project), to the government Watershed Management and Protection Authority, for the management and conservation of the Nakai-Nam Theun Biodiversity Conservation

Area and for sustainable livelihood development opportunities for villagers living in the area. The amount was deemed to be 'entirely adequate to develop an effective and well-resourced management plan implemented by well trained and competent staff'.

- An agreement clearly spelling out the roles and responsibilities of the proponent and the Government of Lao Peoples' Democratic Republic regarding the implementation of the offset and related activities gave important clarity to all stakeholders.

Brisas

- Partnerships with credible international and local NGOs are seen as a key success factor in planning and implementing conservation activities, given the potential contribution of these NGOs to the process.
- A range of possible options was considered to spread risk and optimise possible outcomes, from rehabilitation, assistance with sustainable agro-forestry, to more conventional measures aimed at strengthening existing pristine or protected areas; a so-called 'portfolio' approach.

Antamina

- To help ensure that the project would be financially sustainable over time, Conservation International and The Mountain Institute (a local NGO) are promoting the creation of a trust fund that will provide benefits to the local communities in exchange for their continued commitment to protecting the restored areas as well as protecting other areas through the maintenance of fences and patrolling. Antamina's participation in this fund would secure the conservation results in the long term. The expectation is that a legal agreement will encourage the long-term protection of the restored forests after Antamina is no longer operating in the region.

Mount Royal

- A Renosterveld Management Trust Fund was set up, to be used for the management of conservation areas on the development site and off-site on other Renosterveld habitat within the Swartland Municipal Area. The amount in this Trust Fund was calculated on the basis of funds (interest) required annually to manage each of the off-site properties.

Basslink

- The property to be conserved was purchased, and a management plan prepared, before construction of the project began. The developer will manage the offset areas for a ten year period. The land is to be given protective tenure by its inclusion in the Crown estate.

Kennecott

- The Mitigation Plan specified INDICATORS and monitoring studies to be conducted on the mitigation area, before and after enhancement, to measure environmental changes and evaluate the success of the mitigation efforts.

f) Collaborate and communicate openly

In most of the case studies, the importance of effective engagement with, and buy-in from all stakeholders was emphasised as critical to the success of the planned conservation outcomes.

Box 7: Collaborate and communicate openly

Antamina

- The *Polylepsis* programme was developed in collaboration with Conservation International and The Mountain Institute, an NGO with a long history of working with the Huascarán National Park.
- One of the messages from this case study is not to underestimate the potential for community-based initiatives to manage conservation activities, and benefit from them in the long term.

Kumtor

- A Community Business Forum was established as an effective means to discuss and invite suggestions for optimum interventions to benefit biodiversity and local communities. This Forum includes community representatives, NGOs, authorities and business interests.
- A partnership with the International Snow Leopard Trust was established in a biodiversity project to help protect the Endangered Snow Leopard and other species such as the Ibex and the Rare Marco Polo sheep. The project is being run and implemented by Fauna & Flora International and the Community Business Forum.

Kennecott

- A Mitigation Review Team, comprising representatives from State and Federal regulatory agencies (the Utah Division of Wildlife Resources, U.S. Fish and Wildlife Service, Environmental Protection Agency, and the US Army Corps of Engineers) as well as non-government organisations (The Nature Conservancy, National Audubon Society) was set up to help design the compensatory conservation.
- The involvement of stakeholders ‘up front’ enabled the identification of common ground regarding desired outcomes, and collaborative – rather than adversarial – efforts to address issues.

Brisas

- The potential for developers to forge constructive partnerships with, and outsource the implementation and management of conservation activities to, credible NGOs and local stakeholders is highlighted in the Brisas case study: ‘...mining companies are better at mining, whilst NGOs and other stakeholders have an edge on conservation and credibility. Without the involvement of legitimate NGOs, most biodiversity offset concepts may not gain credibility and would not be able to contribute to a social license’¹⁰.

Cemex

- CEMEX (Mexico’s large cement corporation), Agrupación Sierra Madre (a Mexico-based NGO), Conservation International, The Wild Foundation, Birdlife International and Comision Nacional de Areas Naturales Protegidas (a government body) collaborated in announcing the first Wilderness Designation in Latin America in 2005.

¹⁰ Nazari, M. and Proebstel, D. 2008. Biodiversity offsets in mining. *Mining Environmental Management*, October 2008. www.miningenvironmental.com.

g) Bridge barriers between different disciplines and cultures

The case studies emphasise the value of integrating consideration of biodiversity impacts, socioeconomic impacts and cultural impacts in the design of compensatory conservation measures.

Box 8: Bridge barriers between different disciplines and cultures

Kennecott

- It was important to ensure the integration of different disciplines and professions in arriving at the desired outcome: biologists and engineers had to work closely together, and 'translate' their ideas into language that could be understood by heavy equipment operators on the ground. Effective communication with public stakeholders was equally important: although a quantitative approach (Habitat Evaluation Procedure) was used to determine the size of offset required, a simpler approach to monitoring the success of the offset, to which non-technical people could relate, was also used (bird counts).

h) Be cautious

Some of the case studies explicitly applied a risk-averse approach to determining the size of areas for compensatory conservation where the success of conservation activities was not certain, selecting larger areas or more extensive actions where the biodiversity that would be affected by the project was known to be threatened or particularly vulnerable.

Box 9: Be cautious

Apennine

- The approach taken by the proponent and consultant was to compensate for all those impacts that could be predicted with confidence, and design relatively larger compensation measures for potential impacts for which predictions were uncertain.
- The energy requirements of raptors and the effect of loss of habitat due to the wind farms on the raptors' prey sources were used to calculate the area of habitat and associated prey needed to compensate for that loss. It was acknowledged that there was uncertainty in the calculations. For that reason, wild rabbits that previously existed in the area and / or Grey Partridge would be introduced as food for the raptors.

Basslink

- Multipliers of up to 2x the affected area were applied to native vegetation of high or very high significance in determining the required conservation area.
- The feasibility or affordability of achieving full restoration of vegetation was taken into account in selecting the area for the conservation activities; an area larger than required was purchased to reflect the risk that full restoration might not be achieved uniformly across the whole area. Calculations revealed the maximum possible gain, but the larger area was selected based on a more realistic and cautious assumption about the likely success of re-vegetating the property.

i) Think ahead and think long term

An approach that makes good business and biodiversity sense is to undertake biodiversity studies before planning activities in a 'greenfield' area identified as having development potential. Early identification of highly sensitive and / or significant biodiversity in areas targeted for development improves opportunities for avoiding or minimising negative impacts, and for informing the design of compensatory conservation measures (e.g. Jonah). Also, where a company is proposing to develop in an area and needs (or intends) to provide compensatory conservation, and where there is a strong likelihood of future expansion of activities in future, it may be advantageous to think of establishing a CONSERVATION BANK (e.g. Kennecott Utah, Rhenish-Westphalian).

Box 10: Think ahead and think long term

Jonah

- This project highlights the importance of forward planning in informing and directing the development project and associated compensatory conservation. A 'goal-setting project' such as that conducted by The Nature Conservancy and funded by BP will help the company determine where and how best to invest in conservation at the beginning, middle and end of the project LIFECYCLE.

Kennecott

- A 'bank' of restored habitat was established in addition to the legally required offset. Although 427 ha of wetlands were impacted by the project and legally required for compensatory mitigation, a 1,011 ha site was restored.

Rhenish-Westphalian

- This project involved comprehensive restoration and the establishment of a compensation pool of restored habitat as a bank, creating opportunities for trading in terms of compensation credit points related to habitat value and area.

j) Consider going beyond 'no net loss'

Some conservation activities are likely to result in a 'NET GAIN' for BIODIVERSITY CONSERVATION (e.g. Antamina, Kennecott, Basslink). In one case study, Kumtor, a positive contribution to conservation was made in the absence of significant RESIDUAL IMPACTS. The latter example highlights the potential of a well-resourced development project to make a significant and lasting contribution to biodiversity conservation in an area with important biodiversity. Very often, the benefit to conservation would not occur without the infusion of investment and capacity offered by such development projects.

Box 11: Consider going beyond 'no net loss'

Antamina

- When the mining project was mooted, the Huascarán National Park was faced with a number of pressures: it was surrounded by mining claims, there was overgrazing of pastures, pressure from agricultural use, removal of firewood, and severe tourism impacts in certain areas. The Park and The Mountain Institute (TMI) felt that the impact assessment for the mine was too focused on the technical and footprint impacts of the mine, and that the 'main issue' was protecting the integrity of Park and associated 'landscapes and their potential to be the permanent foundation of a conservation-based regional approach'. There was a clear perception from the National Park and TMI that Antamina offered

a unique opportunity to reduce other previous mining or development threats to the Park. This perspective could have contributed to Antamina's decision to start a broader Polylepis voluntary conservation project.

- The potentially significant residual impacts of the Antamina Mine on biodiversity were minimal: an estimated 1 ha of Polylepis forest. (The other impacts on about 220 ha of natural forest and highland grassland were not deemed to be significant at the time of the impact assessment.) To date, over 125 ha of Polylepis have been successfully restored, about 101 ha of which have formal conservation status through community agreement. In addition, community management agreements extend to almost 12,000 ha of highland Andean ecosystem, comprising 3,000 ha of forest under potential protection, as well as highland grassland. The programme is set to more than offset the residual impacts of the mine on Polylepis habitat.

Kennecott

- Although 427 ha of wetlands were impacted by the project and a similar area needed to be restored in order to compensate fully for that impact¹¹, Kennecott identified and purchased a 1,011 ha site suitable for wetlands mitigation, less than a kilometre from the project site.
- This wetland offset project is recognised as one of the largest and most successful mitigations in the United States. The proponent went beyond legal requirements to provide a large area of restored wetland habitat now internationally recognised as important for resident and migratory shorebirds (the Inland Sea Shorebird Reserve).

Basslink

- Using the HABITAT HECTARES approach, an area of 11.5 habitat hectares would be lost as a result of the project and thus required to achieve 'no net loss'. The offset is designed to deliver 50 – 70 habitat hectares, resulting in a substantial net gain for the impacted native vegetation.

Kumtor

- An Environmental Assessment carried out in the early 1990s and reviewed by an international NGO found that the proposed mine would not result in significant residual impacts on biodiversity.
- Due to economic decline since 1991, pressure on natural resources to support livelihoods had increased dramatically in the area of the mine. Threats to biodiversity included extensive overgrazing and poaching of wildlife. A number of threatened and charismatic species, including the Snow Leopard, were known to occur in the wider area. A real opportunity was seen to make a positive contribution to biodiversity conservation in Kyrgyzstan in general and to support the process of establishing a national nature reserve in the region.
- Funding of the mining project catalysed the designation of the Sary-Chat Ertash Zapovednik strictly protected area. A number of small-grant funded projects and a project to improve management of this protected area have been initiated in the region, making a positive contribution to biodiversity conservation.

¹¹ Using three different Habitat Evaluation Procedure models for nesting shorebirds, shorebirds that used the wetland for feeding and roosting, and 'dabbling ducks', it was determined that a 1:1 impact to mitigation site Habitat Units ratio would be required.

5. Emerging Best Practice and Key Challenges

The following aspects of best practice emerge from the case studies:

- a) Quantitative methodologies for measuring both the residual BIODIVERSITY LOSS as a result of a proposed project, as well as the potential biodiversity gain through compensatory conservation measures or a biodiversity offset, are developing rapidly. A range of these methodologies is illustrated in the case studies, e.g. Basslink, Kennecott, Apennine and NT2. The selection of methodologies will respond to the specific circumstances and requirements of the project, and take into consideration the particular environmental and socioeconomic context. This suggests that a range of existing quantitative methodologies could provide a transparent, explicit and defensible basis for planning biodiversity offsets or other forms of compensatory conservation. Additional methodologies are likely to be developed in the future to respond to this dynamic and challenging field.
- b) There is a growing recognition that, for compensatory conservation activities to be successful, it is vital to pay attention to the socioeconomic (in particular the livelihood) and governance context of the proposed project and potential offset areas (e.g. QMM's increasingly integrated approach). Conservation activities are unlikely to meet their objectives and succeed in the long term unless they compensate local stakeholders for any opportunity costs involved and address the drivers leading to biodiversity loss.
- c) The Basslink case is an illustration of the benefits of matching clearly defined objectives and outcomes with an explicit approach for determining the nature, scope and scale of conservation activities needed.
- d) A formal agreement defining the respective roles and responsibilities of the various parties involved in implementing compensatory conservation activities – as well as the limits and duration of those responsibilities – can provide a robust and auditable framework for implementation, as illustrated in the NT2 case study.
- e) The importance of contributing to regional or national objectives and / or targets for biodiversity conservation through the use of proactive systematic planning tools (e.g. Mount Royal and Jonah) is increasingly clear. Similarly, the long term contribution of compensatory conservation to the public conservation estate and associated security of that offset (e.g. Basslink case study) echoes this point.
- f) Entering into partnerships and involving a spectrum of key stakeholder groups such as government authorities, non-governmental organisations, local communities and / or research institutions helps to guide the design, selection, and implementation of the most appropriate activities.
- g) It is good practice to apply a risk-averse approach to determining the scope and scale of compensatory conservation activities in the face of uncertainty, anticipated threats or probable risks to their success (e.g. Apennine).

The collection of case studies in this report does not include any projects from the agriculture or forestry sectors, which suggests there is less experience of biodiversity offsets and compensatory conservation in sectors outside the extractive and utility industries. The cost or market value of land identified for conservation and the profit margins of the particular projects may have a significant bearing on the BUSINESS CASE for voluntary biodiversity offsets and the capacity of developers to provide conservation outcomes, which may differ from sector to sector.

Key challenges facing the design, location and implementation of compensatory conservation measures including biodiversity offsets are seen to include the following:

- Selecting the most fitting method of quantifying loss and gain where the aim of the project is to achieve no net loss or a net gain of biodiversity.
- Balancing the value of biodiversity (measured in a particular CURRENCY), the market value of land (measured in financial terms), and the value of proposed development (measured in anticipated profit margins and socioeconomic benefits such as jobs) in an equitable way to ensure that long-term biodiversity conservation objectives are met most efficiently. In other words, allowing some flexibility and creativity to find practical ways to achieve the desired conservation outcomes in the context of broader sustainable development.
- Apportioning responsibility for acquiring, managing and ensuring the long-term security of the biodiversity offset in an equitable way between the state (and steward of biodiversity for present and future generations) and the development proponent (impacting on that biodiversity) over time. This involves determining how the risks of offset failure and CUMULATIVE IMPACTS on biodiversity over time should be shared between the development proponent and society at large.



To learn more about the BBOP principles, guidelines and optional methodologies, go to:
www.forest-trends.org/biodiversityoffsetprogram/guidelines