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BIODIVERSITY OFFSETS AND THE BUSINESS AND BIODIVERSITY OFFSETS PROGRAMME (BBOP)

Note by the Executive Secretary

1. In the preamble to its decision VIII/17, the Conference of the Parties noted, that contributions from business and industry towards the implementation of the Convention and its 2010 target could be facilitated by, *inter alia*, further work under the Convention to develop guidance for potential biodiversity offsets in line with the objectives of the Convention. Accordingly, the Executive Secretary is circulating herewith, at the request of the Government of the Netherlands, for the information of participants in the ninth meeting of the Conference of the Parties, an information document on biodiversity offsets and the Business and Biodiversity Offsets Programme (BBOP).

2. The document is reproduced in the form and language in which it was provided to the Secretariat.

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Biodiversity Offsets and the Business and Biodiversity Offsets Programme (BBOP)

A draft consultation paper for discussion and comment

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Introduction

There is a tremendous opportunity today to secure biodiversity conservation and business benefits through the appropriate use of biodiversity offsets. Many companies are actively seeking partnerships with governments and conservation groups to address the environmental impacts of their activities and to enhance their contribution to biodiversity conservation and sustainable development. The Business and Biodiversity Offsets Programme (BBOP) supports this trend.

In response to the current unprecedented loss of biodiversity, governments adopted the ambitious target *'to achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on Earth'*.[1] To achieve this goal, we need new and innovative mechanisms to balance development with conservation. Biodiversity offsets offer one response to the growing appetite for practical approach es to do so.

The Business and Biodiversity Offsets Programme (BBOP) is a partnership of leading conservation groups, governments, companies and financial institutions that is exploring and testing biodiversity offsets. Biodiversity offsets are measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development and persisting after appropriate prevention and mitigation measures have been implemented. Their goal is to achieve no net loss, or preferably a net gain, of biodiversity.

In 2004, Insight Investment and IUCN interviewed some 50 representatives from companies, governments and NGOs worldwide on the topic of biodiversity offsets.[2] Biodiversity offsets were regarded as a mechanism with the potential to promote more and better conservation and to help companies manage their environmental liabilities, risks and business opportunities. To secure these advantages, biodiversity offsets need to be well designed and address certain risks carefully. The main recommendations of this early work included a call for more dialogue on offsets between different sectors of society, real examples of biodiversity offsets in a set of pilot projects, and collaboration on methodologies to inform the development of standards for biodiversity offsets.

In response, Forest Trends launched BBOP in 2004, securing the early involvement of several companies, governments and NGOs, and the commitment of Conservation International to join the Secretariat of the initiative. BBOP is now a partnership, through its Advisory Committee, of some 40 companies, governments, conservation experts and financial institutions from different countries.[3] Collectively, the BBOP partners combine world-class expertise in conservation policy and practice ; systematics and the measurement and monitoring of biodiversity; bioregional and landscape -scale planning; working with local and indigenous communities; risk, project and biodiversity management in business operations; and environmental economics. Many have already assisted in the design and implementation of biodiversity offset projects and the development of public policy on biodiversity offsets in a range of contexts.

The BBOP Secretariat is currently managed jointly by Forest Trends, Conservation International and the Wildlife Conservation Society. BBOP coordinates a portfolio of biodiversity offset pilot projects around the world. With the guidance of its international Advisory Committee, it is developing methodologies and guidelines for biodiversity offset design and implementation and providing advice on the design of pilot projects. In addition, a global 'BBOP Learning Network' of over 600 individuals and organizations interested in biodiversity offsets participates in BBOP events held around the world and shares information and ideas. The programme's current sponsors can be found at www.forest-trends.org/biodiversityoffsetprogram/index.php. The Advisory Committee members are listed at the end of this document. To join the BBOP Learning Network, please send an email request to bbop@forest-trends.org .

BBOP objectives

BBOP aims to develop, test and disseminate good practice on biodiversity offsets and to demonstrate, through a portfolio of pilot projects in a range of contexts and industry sectors, that biodiversity offsets can deliver improved and additional conservation and business outcomes than have often resulted in the context of development projects to date. Working with local communities, NGOs and government agencies involved in conservation and land-use planning, developers can implement biodiversity offsets that enhance local communities' use and enjoyment of biodiversity, deliver prioritized, targeted and cost-effective biodiversity conservation outcomes for the long term, and help companies manage their risks, liabilities and costs.

The BBOP vision is that biodiversity offsets become a standard business practice for all operations (whether undertaken by private or public sector developers) that are likely to have a significant, residual adverse impact on biodiversity, provided that this residual impact is not unacceptable. The routine mainstreaming of appropriate biodiversity offsets into project development would result in long-term and globally significant additional conservation outcomes.

Phase 1 of BBOP: During its first phase (2004-08), BBOP is working to develop:

- a set of principles (see draft on page 4) for best practice on biodiversity offsets;
- an optional 'toolkit' of methodologies and guidelines for biodiversity offsets that project planners can draw upon in the absence of regulatory guidelines, or to supplement them; and
- a portfolio of pilot projects around the world that aim to demonstrate 'no net loss' of biodiversity and livelihood benefits in the context of particular development projects. These pilot projects can apply some of the draft BBOP methodologies under development, and enable BBOP to refine them based on practical experience.

The BBOP partners are also supporting related policy developments at the intergovernmental, national and corporate levels. This includes efforts to integrate biodiversity offsets into existing policy and processes such as impact assessment and land-use planning, as well as supporting the development of policy on biodiversity offsets by governments, companies and industry associations.

Phase 2 of BBOP: BBOP is currently seeking input to define goals for the next phase of the programme, which will start in 2009. Potential opportunities include further work to:

- apply biodiversity offset methodologies in a greater number and broader geographical and sectoral range of pilot projects, worldwide;
- refine and improve the methodology toolkit based on broader practical experience and comments from a range of stakeholders;
- develop broadly accepted standards for biodiversity offsets;
- work with policy makers to build these standards into existing and new policies and procedures;
- explore potential certification and verification systems for biodiversity offsets;
- help catalyze broader international use of eco-regional and landscape-scale planning in biodiversity offset design, and aggregated offsets (where several offsets are planned together);
- contribute good practice in biodiversity offsets to emerging conservation banking and national biodiversity credit schemes; and/or
- explore methodologies for offsetting impacts to biodiversity caused by companies' supply chains.

Principles on biodiversity offsets

The following draft set of principles on biodiversity offsets was prepared by members of the BBOP Advisory Committee who met in Rome in February 2008. They are intended as a draft for comment, so that a final, improved set of principles can be prepared during 2008, based on feedback and further reflection. Some of the principles are simple and self-evident while others need interpretation, so a set of draft explanatory notes, which could be developed into criteria and indicators, has been added. Please send comments and suggestions by 1 September 2008 to: bbop@forest-trends.org .

DRAFT PRINCIPLES ON BIODIVERSITY OFFSETS

A promising opportunity exists for conservation organizations and the private sector to work with civil society and governments to conserve the planet's biodiversity and contribute to sustainable development. Biodiversity offsets offer one mechanism to balance the impacts of development activities with the conservation of biodiversity, the sustainable use of its components and the fair and equitable sharing of benefits.

Biodiversity offsets are measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development and persisting after appropriate prevention and mitigation measures have been implemented. The goal of biodiversity offsets is to achieve no net loss, or preferably a net gain, of biodiversity on the ground with respect to species composition, habitat structure and ecosystem services, including livelihood aspects.

Biodiversity offsets should comply with all relevant national and international law, and be planned and implemented in accordance with the Convention on Biological Diversity and its ecosystem approach. The draft voluntary principles presented here are offered for use where they will complement existing policy requirements, or where no guidance exists. They offer a robust framework under which the design and implementation of biodiversity offsets will contribute not only to positive conservation outcomes, but also to increased collaboration between key stakeholders to address one of our planet's most pressing concerns: the loss of biodiversity. Adherence to these voluntary principles represents a commitment to leadership in environmental stewardship and social responsibility.

1. No net loss: A biodiversity offset should achieve measurable conservation outcomes that can reasonably be expected to result in no net loss of biodiversity.

2. Adherence to the mitigation hierarchy: Biodiversity offsets are a commitment to compensate for significant residual adverse impacts on biodiversity identified after appropriate avoidance, minimization and rehabilitation measures have been taken according to the mitigation hierarchy. Offsets cannot provide a justification for proceeding with projects for which the residual impacts on biodiversity are unacceptable.

3. Landscape context: Biodiversity offsets should be designed and implemented in a landscape context to achieve the best measurable conservation outcomes, taking into account available information on the full range of biological, social and cultural values of biodiversity and supporting an ecosystem approach.

4. Stakeholder participation: In areas affected by the project and by the offset, the full and effective participation of stakeholders should be ensured in all phases of decision-making about biodiversity offsets, including their evaluation, selection, design and implementation. Special consideration should be given to the existing, recognised rights of indigenous and local communities.

5. Equity: Biodiversity offsets should be designed and implemented in an equitable manner, which means the sharing of the rights and responsibilities, risks and rewards associated with a project in a fair and balanced way among the stakeholders.

6. Long-term success: The design and implementation of biodiversity offsets should have as their objective sustained outcomes in terms of: a) the viability of key biodiversity components, b) the reliability and accountability of governance and financing, and c) social equity.

7. Transparency: The design and implementation of biodiversity offsets, and communication of their results to the public, should be undertaken in a transparent manner.

DRAFT EXPLANATORY NOTES ON THE PRINCIPLES

The following draft explanatory notes supplement and explain the short principles above. They could be elaborated into criteria and indicators which could be used as the basis for verification and certification systems in the future.

Explanatory Notes on Principle 1. *No net loss:*

Biodiversity offsets are targeted to achieve conservation 'on the ground'. This includes activities such as strengthening the management of conservation areas, whether formal or informal, and rehabilitation of habitats. It does not include the introduction of alien species. Supporting actions such as awareness raising, environmental education, research and capacity building are a welcome contribution to conservation and can be important to the overall success of a biodiversity offset, but they are not considered part of the core offset, unless there is evidence of measurable on-the-ground conservation outcomes.

In addition:

a) A biodiversity offset should achieve an additional conservation gain, from both biological and social perspectives, beyond that which would have occurred in the absence of the offset activities.
b) The offset gain should be equivalent to, or greater than, the loss of biodiversity caused by the project, as represented by practical and meaningful proxy measures.
c) Biodiversity offsets should take into consideration all the hierarchical levels of biodiversity, for instance, species, biotic communities and ecosystem processes, using the best available science. They should also operate at the appropriate scale and reflect the broad range of biodiversity values, including intrinsic and use values (embracing cultural, spiritual and aesthetic values).
d) Biodiversity offsets should address secondary and cumulative impacts in the assessment of impact, recognising that these are likely to be a shared responsibility.
e) At the species level, no net loss can be framed around an approach in which no known species undergoes a change in threat status such that its current likelihood of global extinction is increased. ('Known species' are those on the IUCN Red List, and other species on which additional scientific information is available, such as national or local lists.)

Explanatory Notes on Principle *2. Adherence to the mitigation hierarchy:*

The type of impacts on biodiversity that may be considered unacceptable are generally based on considerations of the irreplaceability and vulnerability of the biodiversity affected, established by the stakeholders on a case-by-case basis.

Some projects may result in certain impacts on biodiversity that cannot be offset, because there is simply no way to compensate for the loss of biodiversity involved (for instance, the extinction of a locally endemic species). If such projects are authorised to go ahead, any compensatory conservation activities undertaken could be worthwhile, but could not be regarded as a biodiversity offset.

Explanatory Notes on Principle *3. Landscape context:*

Offset design and implementation should:

a) Be informed, where these are available and as appropriate, by the strategies identified in regional conservation and development plans, including information on threats and targets. This can support consideration of issues such as connectivity in the siting of offsets.
b) Address issues of scale.
c) Secure additional conservation outcomes that would not have been achieved without the offset.
d) Avoid displacing harmful activities that impact biodiversity to another location.
e) Consider issues of local governance, institutional capacity and resources.

Explanatory Notes on Principle *4. Stakeholder participation:*

Stakeholders include persons or groups who are directly or indirectly affected by a project, as well as those who are interested in a project and/or have the ability to influence its outcome, either positively or negatively. They may include persons or groups who hold rights over land and resources.

Stakeholder involvement should:

a) Ensure that decision-making is equitable and transparent, with an adequate conflict resolution mechanism.
b) Involve the identification of stakeholders at appropriate levels – local, national and global.
c) Give special consideration to respecting both internationally and nationally recognised rights of indigenous and local communities.
d) Ensure that decision-making involves the full and fair use of a balance of scientific and traditional knowledge.
e) Ensure that decision-making considers the full range of biodiversity values, including intrinsic and use values (embracing cultural, spiritual and aesthetic values).
f) Follow legally defined decision-making processes, where they exist. Where they do not, the highest and best standards should be used.

Explanatory Notes on Principle *5. Equity:*

This principle should be read in conjunction with the principle on stakeholder participation, which offers a procedural basis for arriving at a fair and equitable outcome.

Further explanatory notes on this principle are likely to be developed.

Explanatory Notes on Principle *6. Long-term success:*

Plans for offsets will need to be dynamic and flexible, to take account of changing circumstances (e.g. climate change, human population growth and habitat loss), while also ensuring long-term security and achievement of the goals of the offset.

Long-term management of biodiversity offsets should be based on an adaptive management approach. It should be built upon a strong monitoring and evaluation component, in order to evaluate whether success criteria, established for each offset on a case-by-case basis, have been achieved.

Explanatory Notes on Principle *7. Transparency:*

Project developers should provide access to information on the manner in which the biodiversity offset has been designed and implemented, including how this set of principles has been applied.

BBOP work plan

The BBOP Advisory Committee intends to finalise the results of the first phase of its work by the end of 2008. These will be published in early 2009. During the remainder of 2008, BBOP plans to:

- revise, based on further reflection and consultation, the draft principles and explanatory notes (page 4);
- prepare and release for comment the draft 'toolkit' of methodologies and guidelines for biodiversity offsets, and to finalise the improved versions of these; and
- make progress with the portfolio of pilot projects and write up the experiences and lessons learned as case studies.

Between May 2008 and mid-October 2008, the BBOP Secretariat plans to initiate a process of consultation on the draft BBOP documents, seeking feedback and suggestions from interested persons to help us improve the quality and usefulness of the materials. A schedule of this consultation process will be posted on the BBOP website. (Please see www.forest-trends.org/biodiversityoffsetprogram.)

The first material available for public consultation and review is the set of draft Principles on Biodiversity Offsets contained in this document (see page 4). Please submit any comments and suggestions for improving this draft by 1 September 2008. To do so, please see the website above for online consultation, or contact Patrick Maguire at Forest Trends (bbop@forest-trends.org).

In addition, some of the BBOP pilot projects have prepared Fact Sheets introducing each project and outlining progress to date and next steps. These Fact Sheets are in Annex 3 (pages 19-50).

Initial guidance: The draft BBOP toolkit

As part of the first phase of the programme, BBOP is preparing a draft toolkit of methodologies and guidelines for biodiversity offsets, to complement the principles. The toolkit currently consists of a set of key questions for offset planners and three draft handbooks. The handbooks offer a selection of activities and procedures that companies can use as a guide in the design and implementation of a biodive rsity offset project. The thinking on biodiversity offsets is still evolving around the world, as companies, conservation groups and other stakeholders develop projects and experiment with different approaches. For this reason, and since the circumstance s in which biodiversity offsets may be used will vary considerably around the world, the BBOP handbooks are not intended to offer a single route to design and implement biodiversity offsets, but rather to raise a set of issues for consideration and offer some methods that companies and other interested stakeholders can apply to their specific ecological, institutional and political context. Each of the draft handbooks will be released as part of the BBOP Secretariat's consultation process during 2008. For the consultation schedule, please see www.forest-trends.org/biodiversityoffsetprogram. The handbooks are as follows:

- **Biodiversity Offset Design Handbook:** This draft handbook offers a step-by-step process for offset planners to adapt and use in designing a biodiversity offset, from conception through to site selection and the definition of the offset activities. It is presented in three sections: (1) Outline: a brief summary of each step in the process, accompanied by clickable links to further information in the subsequent two sections; (2) Tools: a set of potential tools for biodiversity offset design, in the form of templates, with checklists and examples; and (3) Guidance: more detailed information and guidance, including references on key issues and a detailed example of a fictional biodiversity offset design process. For a more detailed outline of the content of the Biodiversity Offset Design Handbook, please see Annex 2.

- **Biod iversity Offset Implementation Handbook:** This draft handbook is meant to be used once the nature of offsetting activities and the magnitude and location of the offset have been identified (for instance, using the Biodiversity Offset Design Handbook). The Implementation Handbook can help an offset planner put in place mechanisms to ensure effective implementation, permanence and good governance. It discusses the roles and responsibilities of potential stakeholders and the legal and institutional aspects of establishing an offset. Then it guides a planner in developing a biodiversity offset management plan, establishing long-term financing for the offset, and monitoring and evaluating the results. As above, the Implementation Handbook is presented in three sections: Outline, Tools and Guidance.

- **Biodiversity Offset Cost-Benefit Handbook:** This draft handbook guides planners through the process of evaluating the impact of a project and associated offset on local values and uses of biodiversity, particularly by communities. It is designed to be used in conjunction with the other handbooks, throughout the design and implementation of a biodiversity offset. To be successful, a biodiversity offset should compensate communities for any residual impacts of a development project – and a biodiversity offset – on their biodiversity-based livelihoods and amenity. Communities should be better off as a result. This handbook offers guidance on how to use the economic tools of valuation and cost-benefit analysis to compare the benefits to a community of the offset with the costs to the community of the residual biodiversity-related impacts of both the development and the offset. Like the other two handbooks, the Biodiversity Offset Cost-Benefit Handbook is presented in three sections: Outline, Tools and Guidance.

ANNEX 1:
INTRODUCTION TO BIODIVERSITY OFFSETS

What are biodiversity offsets?

The term 'offset' is used in a range of regulatory environments, such as conservation banks in the US and trading systems for environmental pollutants, such as greenhouse gases. The specific activities or interventions that count as an adequate offset in the context of these different policy settings vary, just as the definition of biodiversity offsets vary in policy instruments around the world. In the hope of stimulating discussion to promote an understanding of biodiversity offsets through the BBOP process, and for the purposes of this document, we offer the **working definition for biodiversity offsets** on page 4 (second paragraph). Box 1 provides examples of conservation activities that might be included in a typical biodiversity offset.

Box 1. Typical biodiversity offset activities

What kind of activities can offset biodiversity impacts?

The conservation actions involved in biodiversity offsets can include the full range of management interventions to protect land, aquatic and marine ecosystems, and activities related to the sustainable use of biodiversity. They can be broadly categorized as:

- Positive management interventions, such as actively restoring, translocating or re-introducing existing or previously present biodiversity components, or removing invasive alien species.
- Stopping degradation that is currently occurring by, for example, stopping an inappropriate grazing regime, controlling pest plants or animals, re-instituting an appropriate fire regime, stopping illegal use of resources, increasing guard patrols, stopping soil erosion, reducing water turbidity, etc.
- Averting the proven risk of damage from a future event, for example, by entering into a conservation easement so landowners give up (possibly in return for payment) the right to undertake in the future certain destructive activities, such as habitat conversion.

While appropriate biodiversity offset activities will vary from site to site, typical land (and aquatic and marine) management interventions that result in measurable conservation outcomes on the ground might include:

- Restoring or rehabilitating degraded areas: replanting indigenous species on degraded land and removing invasive fauna and flora.
- Strengthening protected areas: investing in additional management activities in neglected zones of a forest reserve (e.g. replanting degraded areas or removing alien invasive species) to improve its conservation status.
- Protecting threatened areas: averting the risk of unplanned or illegal projects on unprotected land of value for biodiversity conservation by working with communities or with government to undertake conservation activities.
- Sustainable use projects delivering conservation outcomes: for instance, developing horticulture of medicinal plants or creating sustainable use systems for megafauna that reduce the loss of biodiversity in the wild.
- Addressing underlying causes of biodiversity loss: working with communities to develop alternative livelihoods through improved technical expertise in local management bodies, introduction of improved agricultural techniques and the cessation of unsustainable activities (e.g. fuel wood chopping, crop plantation in forests, unsustainable levels of livestock) and replacement with alternative sustainable land management practices.
- Improving habitat connectivity: identifying and securing the conservation management of land that provides biological corridors between protected areas or other areas of significant biodiversity value.
- Establishing buffer zones: for instance, introducing or expanding a buffer zone around a national park.
- Zoning marine areas: for example, defining and protecting areas important for feeding and breeding of marine species. Working with companies and communities to avoid exploitation in

these areas. Supporting alternative sustainable aquaculture initiatives for communities to compensate for lost income.
- Securing species migration paths: establishing interventions to secure paths to enable the safe migration of land and air-based fauna.

Benefits – why offset?

Used in appropriate circumstances, well designed and carefully implemented, biodiversity offsets can provide benefits for business, government, communities, conservation organisations and the financial community:

➢ **Benefits for business:**

Biodiversity offsets can help companies manage their risks more effectively and strengthen their license to operate by showing regulators that operations can be based on a 'no net loss' or 'net benefit' approach to biodiversity and by securing the support of local communities and civil society. A growing number of companies, especially in the extractive sectors, have demonstrated that there is a business case for going beyond mitigation to compensate for the full impact that their activities have on biodiversity. Good management of environmental and social issues benefits companies' 'bottom line' and, conversely, poor management of biodiversity issues, can harm financial performance. Companies are increasingly seeking to demonstrate good practice on environmental issues to secure their license to operate and access to capital, to obtain permits rapidly and operate cost effectively, and to maintain a competitive advantage as preferred partners with governments and other stakeholders (see Box 2). Conversely, bad environmental practice can lead to higher operating costs, costly permit delays, liabilities, and lost revenues. For companies, biodiversity offsets are a means of demonstrating a stewardship approach to the natural environment and justifying the continued access to the terrestrial and marine areas and natural resources needed for their operations.

Box 2. The business case for good practice in biodiversity management and biodiversity offsets

The incentives for companies to improve the management of their impact on the environment, specifically on biodiversity and by making biodiversity offsets, are becoming clearer and include:

- Continuing access to land and capital.
- Increasing investor confidence and loyalty.
- Reducing risks and liabilities.
- Strengthening relationships with local communities, government regulators, environmental groups and other stakeholders.
- Building trust on a credible reputation for environmental and biodiversity-related management performance and winning a 'social license to operate'.
- Increasing 'regulatory goodwill' which could lead to faster permitting.
- Influencing emerging environmental regulation and policy.
- Developing more cost-effective means of complying with increasingly stringent environmental regulations.
- Taking advantage of 'first mover' benefits in the market.
- Maximizing strategic opportunities in the new markets and businesses emerging as biodiversity offsets become more widespread.
- Strengthening staff loyalty.

It is important to note that the relative significance of each of these incentives may vary dramatically from one geographical, cultural or regulatory context to another, from industry sector to industry sector, and company to company.

- **Benefits for government:**

Biodiversity offsets offer regulators a mechanism to encourage companies to compensate fully for losses to biodiversity and make important contributions to conservation, in many cases without the need for new legislation and with lower costs than alternative policies. Offsets can also help to ensure that project developments intended to meet growing demand for energy, minerals, metals, crops and transport are planned in the context of sustainable development, and are accompanied by counterbalancing measures to secure the conservation of ecosystems and species affected by a project. Also, offsets can generate revenues from the private sector to enhance the budgets of government agencies and meet national biodiversity targets and goals.

- **Benefits for conservation organisations:**

Biodiversity offsets can result in more and better conservation and increase the funding available for conservation. Designing and implementing biodiversity offsets in the context of regional development and at the landscape scale allows offsets to contribute to the strategic aims and objectives of conservation planners. For example, offsets can be designed to establish properly financed ecological corridors or to strengthen networks of protected areas. Offsets can also help ensure that national or regional conservation priorities are integrated into business planning. Finally, offsets encourage companies to take full responsibility for their impacts on biodiversity.

- **Benefits for communities:**

Communities can use biodiversity offsets to ensure that the ecosystems on which they often depend are functioning and productive during and after project development, not only with rehabilitated project sites, but also with additional conservation outcomes outside the project's borders, to support livelihoods and amenity. Net gain with respect to livelihood values can also be a goal for a well-managed offset.

Challenges and limitations

While biodiversity offsets may, in some circumstances, be able to provide the benefits to business, government, communities, conservation organisations and the financial community described above, there are risks associated with making biodiversity offsets and limits on what they can and should be expected to achieve. The question of their appropriateness and effectiveness as an environmental mitigation mechanism is debated in the conservation and business communities alike. A strong set of principles, such as those presented in draft form in this document, can help ensure that biodiversity offsets are only used where appropriate and are designed and implemented so as to avoid or manage the risks. However, to aid understanding of the concerns that have been voiced about the inappropriate use and misapplication of biodiversity offsets, some of the key risks are outlined here:

- **Inappropriate projects get the go-ahead:**

Perhaps the strongest concerns about biodiversity offsets are that they could make it easier for developments to proceed that have a very significant impact on biodiversity that in many cases would be judged unacceptable, on the back of claims that the damage to biodiversity will be offset. There is a concern that biodiversity offsets could be used as a form of 'green washing'. Fundamental to good practice in biodiversity offsets is the recognition that some impacts on biodiversity simply cannot be offset, and also that offsets cannot provide a justification for proceeding with projects for which the residual impacts on biodiversity are unacceptable. Application of a principle such as draft principle 2 in this document ('Adherence to the mitigation hierarchy') should help address these concerns.

- **Lack of additionality**:

Offset activities should be new or additional and not 'business as usual'. That is to say, biodiversity offsets should be activities that would not have been implemented in a 'no offset', or even a 'no development', scenario. Offset planners should address the risk there is no true 'conservation additionality' as a result of the biodiversity offset.

- **Cost-shifting**:

The fact that companies take responsibility for their footprint on biodiversity and internalize the costs of conservation is an advantage of biodiversity offsets. However, this investment in conservation by developers is not an alternative to public investment in conservation by government, but should supplement it.

- **Leakage** :

In designing offsets, developers should seek to avoid displacing the harmful activities that impact biodiversity to another location, an outcome known as 'leakage'. Landscape level planning can help address this risk.

- **Lack of implementation capacity and lack of clarity on liabilities:**

Offsets are long-term commitments. There is a risk that an offset may be well-designed, but that the organisations responsible for implementing it are not obliged to carry this responsibility forward into the long-term future. They may also lack the human, institutional, legal and financial capacity to take on such a long-term commitment. In addition, offsets represent enduring liabilities for developers, unless the offset (and associated liability) can be transferred to a secure, independent third party that can manage the offset over an appropriate period. There is a risk that these issues will not be adequately addressed during the design of a biodiversity offset.

- **Challenges of quantification and offset design:**

Given our incomplete knowledge of biodiversity and ecosystem functions and services, there are considerable challenges to be met in quantifying projects' impacts on biodiversity and the nature and amount of conservation actions needed to offset them. Demonstrating no net loss of biodiversity is currently difficult or at least equivocal. The quest for quantification is a long-term undertaking and one shared with the biodiversity and business communities for broader environmental management purposes, not just biodiversity offsets. It is important to note that different groups in society attach different values to biodiversity components. For an offset design process to be credible, it needs to involve the full range of stakeholders, to capture these different values. Consensus building within a broad stakeholder constituency is a sensible approach to minimizing risk and facilitating conservation progress while quantification methodologies become more robust.

In search of solutions

A number of potential solutions could help society benefit from the advantages of biodiversity offsets, while managing their risks effectively. They include:

- **Principles and Key Questions:**

Designing and implementing biodiversity offsets is a complex process and there is a need for guidance based on experience in the field, to which BBOP is contributing. The planned benefits from biodiversity offsets might not be realized if they are not carefully designed and implemented. BBOP is in the process of developing a set of principles that we believe are fundamental to the successful implementation and uptake of offsets. These are introduced on page 4. BBOP is also working on a set of 'Key Questions' to which it would be helpful for any developer of a biodiversity offset to be able to provide a sound answer, backed up with evidence (see page 20).

- **Tools:**

Governments obliging developers to undertake biodiversity offsets may provide tools to support them in the design of the offsets. However, some government requirements do not offer practical guidance in biodiversity offset design. Furthermore, developers planning a voluntary biodiversity offset where there are no such legal requirements will struggle to find comprehensive sets of tools to help them. BBOP aims to provide a number of optional tools to support offset planners working in a wide variety of circumstances.

- **Examples:**

Nothing is as persuasive in demonstrating that an approach works as a real example that people can study. We hope that observers will be able to review a growing number of case studies of biodiversity offsets, and even visit projects. For this reason, one objective of BBOP is to establish a portfolio of pilot projects, and another is to document some other examples of biodiversity offsets. The BBOP Pilot Project Fact Sheets (see pages 19-50) offer initial information on some of the BBOP pilot projects.

- **Standards and verification:**

Much of the controversy surrounding biodiversity offsets might be diffused, and the mechanism used more regularly and to better effect, if there were broad agreement and credible standards on the design, implementation and sustainability of biodiversity offsets, including methods of verification. Developers will hesitate to undertake offsets voluntarily if they feel they will be criticized for a half-hearted attempt at compensation that could be challenged as falling short of the expectations of stakeholders and experts in the field. In its first phase of work, BBOP is focusing on principles and a toolkit. In its second phase, BBOP plans to support international work on the development of standards for biodiversity offsets.

ANNEX 2 :
INTRODUCTION TO THE DRAFT BBOP BIODIVERSITY OFFSET DESIGN HANDBOOK

The BBOP Draft Biodiversity Offset Design Handbook offers one possible approach to the biodiversity offset design process. It presents a step-by-step process for offset planners to adapt and use in designing a biodiversity offset, from conception through to site selection and activity definition. The handbook is presented in three sections: (1) Outline: a brief summary of each step in the process, accompanied by clickable links to further information in the subsequent two sections; (2) Tools: a set of potential tools for biodiversity offset design, in the form of templates, with some checklists and completed examples; and (3) Guidance: more detailed information and guidance that supplements the outline in the first section, including references on key issues and a worked example of a fictional biodiversity offset design process. The following annotated table of contents offers a brief summary of the content found in both the Outline section and, in further detail, in th e Guidance section. The full text of th e draft document is available on request as part of the BBOP Secretariat's overall consultation process. For more information on this consultation process, please see www.forest-trends.org/biodiversityoffsetprogram.

The nine steps in this handbook are laid out in a broadly chronological order. Although some steps do depend upon the outcomes from earlier steps, some of the activities and steps are interdependent and can be undertaken in parallel, rather than sequentially. The order presented here does not preclude alternative approaches or other sequences. It is offered as an example only. The approach should be based on the local context, available resources, etc. Offset planners can also keep in mind opportunities to bundle the steps to achieve greater efficiencies.

Activity 1: Orientation/Getting Started

Before a biodiversity offset is designed and implemented, the project developer and affected parties should consider a range of issues, in order to establish the appropriateness of the project, its nature and scale, the expected biodiversity focus of the offset and the affected parties. Thinking through these issues will enable offset planners and stakeholders to reach agreement as to whether a biodiversity offset is actually required and/or appropriate, and what additional information and work may be needed to design the offset. The information gained during Activity 1 is used to inform and underpin the activities undertaken in subsequent stages.

Step 1: Define the principal elements of the project and delimit preliminary site boundaries

This step guides the offset planner through the process of understanding the scope of the development project by identifying the various activities and elements of the project (e.g. buildings, roads, excavations, power lines) throughout the different stages of the project life cycle, based on location, duration and degree of certainty.

Step 2: Identify relevant stakeholders and develop an initial participation plan

This step helps offset planners understand the full range of stakeholders who are affected by the project, have an interest in the project or could affect or contribute to it in some way. Early identification of and engagement with stakeholders is vital to the development of a credible, widely accepted and successful biodiversity offset.

Step 3: Review regulatory or legal requirements for a biodiversity offset

Several governments have already enacted legislation or introduced policy guidelines to guide biodiversity offsets, and understanding these requirements in the context of a development project is an important factor in developing a successful biodiversity offset. This review process can also help planners understand the government approval processes required for an offset.

Activity 2: Analyze Biodiversity Components and Project Impacts to Determine the Residual Biodiversity Impacts to be Offset

A biodiversity offset is designed to compensate for significant residual adverse impacts on biodiversity (direct, indirect and cumulative) arising from project development and persisting after appropriate prevention and mitigation measures have been developed. In order to determine what those residual

impacts are – and thus what the scope of the offset should be – it is necessary to first understand the biodiversity components at the impact site, the potential significance of the project's impacts on those components, and the prevention and mitigation activities that are appropriate for the project developer to avoid and minimize residual impacts. Activity 2 guides the project developer through a potential process for answering these questions. (Note: indirect and cumulative impacts are likely to be a shared responsibility with other developers and actors, and may need to be addressed in partnership.)

Step 4: Identify biodiversity components occurring at the impact site

This step offers the offset planner a proposed methodology for identifying the key biodiversity components occurring at the project site and their relative conservation significance.

- *Step 4.1: Reviewing EIA baseline data (where available).* Information from existing Environmental Impact Assessment and baseline biodiversity assessments can be an important starting point for identifying the key biodiversity components at a project site.
- *Step 4.2: Completing a biodiversity assessment.* Field surveys can be used to help fill in any gaps identified in existing EIA and other assessment data. This step guides the offset planner through such an assessment process, in order to identify the key biodiversity components occurring at the project site, including species, habitats and ecosystem services.

Step 5: Determine the potential significance of the project's impacts on biodiversity and apply the mitigation hierarchy

This step guides the offset planner through the process of identifying the potential effects of the project on the key biodiversity components identified in the previous step and applying the mitigation hierarchy to avoid or mitigate significant impacts. This process allows planners to determine the residual adverse impacts of the project that will need to be addressed by the offset.

- *Step 5.1: Identify potential project impacts on biodiversity components.* In this step, project planners consider how the project will impact the biodiversity components identified during Step 4.2 and identify any project activities likely to lead to impacts that could not be offset.
- *Step 5.2: Identify mitigation and offset measures for all impacted components.* This step involves applying the mitigation hierarchy to identify appropriate avoidance, minimization and rehabilitation measures to address these potential impacts.
- *Step 5.3: Determine residual biodiversity impacts at the project site.* This final part of Step 5 helps the offset planner identify the residual biodiversity impacts that will remain after the mitigation hierarchy has been fully applied. These residual impacts will become the focus of the biodiversity offset.

Activity 3: Quantify the Residual Impacts to Determine the Amount of Offset Required

This activity offers one possible methodology that offset planners could use to quantify predicted or actual residual impacts on biodiversity at the impact site. This quantification facilitates subsequent comparisons between biodiversity losses at the impact site and biodiversity gains at potential offset sites, in order to determine which offset site or sites will achieve no net loss, or preferably a net gain, of biodiversity. Methodologies for quantifying biodiversity loss and gain are still being developed and biodiversity offset practices are evolving around the world, so this Activity will offer a number of different approaches.

Step 6: Quantify losses with respect to key habitats and species at the impact site

A number of different approaches to quantifying biodiversity losses at the impact site will be introduced in Step 6. For example, the approach summarised below is one method that is being developed by BBOP, drawing on experience in Victoria, Australia. It walks the offset planner through the process of establishing a 'benchmark' of surrogate attributes against which biodiversity losses and gains at the impact and offset sites can be consistently and transparently measured, to determine whether a project achieves no net loss.

Quantify residual losses with respect to habitats at the impact site:

- *Step 6.1: Identify a benchmark site.* In this step, the offset planner identifies a site that represents a well-conserved example of the ecosystem(s) and biodiversity components found at the project development site, in order to set an objective basis against which the project site (before and after impacts) and candidate offset sites (before and after the offset) can be compared.
- *Step 6.2: Select and weight the benchmark attributes and record the reference level of each.* This step helps the offset planner select a number of weighted 'attributes' that are representative and characteristic of the physical habitat, community structure and composition of the benchmark site. These attributes, each of which is weighted according to its relative importance to the overall health of the ecosystem at the benchmark site, are used as surrogates for the amount and quality of biodiversity present at the benchmark site. They will later be used to compare pre-impact and post-impact condition at the impact site, thus quantifying loss.
- *Step 6.3: Quantify the pre-project condition of the attributes at the impact site.* In this step, the offset planner can determine the pre-project condition or level for each attribute at the project impact site, in order to develop a quantifiable pre-impact baseline score for attributes within each habitat type at the impact site. This baseline score will be defined using a metric called 'habitat hectares.'
- *Step 6.4: Predict the post-project condition for each attribute.* Next, the project planner predicts the post-project condition for each attribute that is expected once the impact has taken place, and develops a predicted post-impact score for the project site, defined using the habitat hectares metric.
- *Step 6.5: Calculate the biodiversity loss at the impact site.* The final step in the benchmarking process involves calculating the habitat hectares predicted to be lost through the project, by subtracting the post-project habitat hectares score from the pre-project habitat hectares score. The result will be a way to quantify the amount of residual biodiversity impact that will need to be offset. It offers a richer, more 'three dimensional' way of quantifying biodiversity losses (and gains) than a simple, area-based approach.

Quantify residual losses with respect to key species at the impact site:

A complement to the benchmarking process above (which focuses on ecosystems, habitats and the attributes that define them) involves quantifying biodiversity loss at the project impact site with respect to species of conservation significance, in cases where these species may experience impacts other than, or in addition to, habitat degradation and conversion (e.g. accidental road kill, intensified hunting pressure, increased disturbance or interruption to migration or dispersal). In such cases, metrics specifically tailored to the species concerned may be valuable in order to strengthen the likelihood that the offset will be designed in such a way as to bring about no net loss of biodiversity.

Activity 4: Offset Site Selection and Evaluation

This activity guides planners through the steps involved in identifying a shortlist of potential sites to offset the residual adverse impacts that will occur at the project site. This activity can help offset planners evaluate each site, based on whether it meets the requirements for a successful biodiversity offset, and compare the potential sites to determine which offset site and activities, or combination of sites and activities, would result in the optimum biodiversity offset for their project.

Step 7: Develop a shortlist of potential offset sites

This step offers some options to the offset planner on how to develop a shortlist of potential offset sites.

- *Step 7.1: Determine whether the offset is a candidate for an out-of-kind offset.* This step involves reviewing the expected impacts at the project site to determine whether the biodiversity offset should conserve essentially the same type of biodiversity (ecosystem, habitats, species) at the impact and offset sites (an 'in-kind' offset) or whether there are good reasons for the offset to conserve different biodiversity of higher conservation priority (an 'out-of-kind' offset, sometimes known as 'trading up').
- *Step 7.2: Identify potential offset sites.* In this step, the offset planner begins identifying potential offset sites by evaluating a number of potential sites to determine which have the ability to fulfil the offset requirements. The step also offers guidance on how to begin eliminating unsuitable areas.

Step 8: Select appropriate offset sites

This step builds upon the comparison of offset sites begun in Step 7 by guiding the offset planner through a number of ways in which a more detailed assessment of the shortlist of potential offset sites could be undertaken, using the attributes identified during the benchmarking process to identify an optimal site or set of sites that meet the offset objectives.

- *Step 8.1: Screen sites on the basis of the biodiversity components they support.* This step helps developers determine the extent to which the biodiversity components identified in Step 4.2 are met by each of the prospective offset sites, based on available information. It can also help identify which sites should be eliminated because they do not support the biodiversity components for which in-kind offsets are considered essential.
- *Step 8.2: Screen sites on the basis of their potential to demonstrate additionality.* This step involves four sub-steps that would allow the offset planner to determine whether the conservation gains at the offset site would or would not have happened anyway, in the absence of intervention by the developer. This is done by comparing how the biodiversity components are predicted to change under the status quo scenario with how they would change under the offset scenario.
    - Step 8.2.1: Quantify and map pre-intervention condition classes at each shortlist offset site. This step would use the same quantification approach selected in Step 6 to establish the relative biodiversity value of the potential offset site(s) and the level of potential conservation gains that could be achieved at each.
    - Step 8.2.2: Assess the threats facing each potential offset site. Next, the offset planner identifies opportunities to achieve conservation gains by addressing the threats to biodiversity at each site, based on an assessment of the probability and expected magnitude of change that would result in a status quo scenario.
    - Step 8.2.3: Identify interventions to address threats facing each site. Offset planners can now begin to identify management interventions that can be used to address the threats to biodiversity at a particular offset site to achieve conservation gains, including positive management interventions, stopping degradation, and averting risk.
    - Step 8.2.4: Calculate conservation gain at each potential offset site. Finally, offset planners work with experts to predict the level of change in conservation status of biodiversity that can be achieved via various types of offset interventions, based in part on the probability of these interventions being fully implemented over the course of the offset.

- *Step 8.3: Screen sites on the basis of their sufficiency to support key biodiversity components in the long term.* This step guides offset planners through a process of eliminating any potential offset sites that are not considered to be sufficient (alone or in combination with other sites) to support into the long term the key biodiversity components for which an offset site is being sought. The most important factors that determine the sufficiency of a site are area and context within a broader landscape.
- *Step 8.4: Classify candidate offset sites into levels on the basis of their conservation priority.* In order to maximize conservation outcome from a biodiversity offset, an offset planner can prioritize candidate offset sites on the basis of various criteria, the most important of which is conservation priority. This step guides planners through a prioritization process, based on irreplaceability and vulnerability.
- *Step 8.5: Prioritize candidate offset sites within each level on the basis of additional criteria*. The next step helps offset planners further prioritize candidate offset sites based on additional criteria.
    - Step 8.5.1: Review landscape-level planning opportunities and constraints. Here, offset planners consider the ability of each site to contribute to broader landscape-level conservation goals.
    - Step 8.5.2: Consider socio-economic gains possible at each candidate offset site. Next, offset planners consider the potential socioeconomic gains for each shortlist offset site.
- *Step 8.6: Assess whether biodiversity multipliers are required and calculate the area needed for the biodiversity offset.* This step helps the offset planner consider whether it is advisable or required for the offset to conserve an area greater than that suggested by basic offset calculations, in order to successfully achieve no net loss with respect to project impact. The process described above will generally arrive at a starting point for the offset area needed to achieve no net loss. The offset area is often larger than the area impacted, since the offset gains are incremental gains on top of the current biodiversity status at the candidate sites. In addition, some approaches (such as the Benchmark approach described above) incorporate an assessment of the risk of success/failure into the basic offset calculation. However, using a 'multiplier' on top of this to increase the ratio of area

conserved to area impacted can help account for the risk that some offsetting activities will not achieve their full conservation potential. This step offers guidance to offset planners on how to evaluate and apply multipliers to best effect.

Step 9: Define the activities for the biodiversity offset and their location

The final step in the offset design process guides offset planners through the completion of a document detailing the specifics of the proposed offset site and intervention. These results are then used for the more detailed consultative and planning process described in the Biodiversity Offset Implementation Handbook. The Implementation Handbook discusses roles and responsibilities of potential stakeholders, legal and institutional aspects of establishing an offset, the development of a biodiversity management plan, long-term financing options for biodiversity offsets, and monitoring and evaluation protocols to track implementation success and conservation impact.

ANNEX 3:
BBOP PILOT PROJECT FACT SHEETS

Introduction to the Fact Sheets

One of BBOP's three objectives is to establish a portfolio of practical pilot projects, each voluntarily undertaking a biodiversity offset in the context of a project such as the development of a mine, an oil and gas exploration and development, or road or real estate construction. BBOP is presently both supporting and learning from the experience of a number of pilot projects, some of which started when the programme began, others of which have joined the programme and started work on a biodiversity offset in recent months. In each of these projects, the developer is undertaking the biodiversity offset on a purely voluntary basis, rather than as a regulatory requirement. Each of the pilot projects is only part way through the process of designing an appropriate biodiversity offset, so the information shared in the following Fact Sheets is preliminary, and takes the form of a brief, summary progress report. The pilot projects are led by the developer undertaking the voluntary biodiversity offset, but in each case, the developer is also working with a group of advisors drawn from local stakeholders and experts and some members of the BBOP Advisory Committee.

The approach and process for offset design can vary greatly and should be determined to suit to the specific circumstances of each case, but it often follows a typical progression such as:

- Understand scope and impacts on biodiversity of the project concerned.
- Check that the mitigation hierarchy has been appropriately and carefully followed.
- Identify the residual impacts on biodiversity to be offset. This involves assessment of the nature of the biodiversity affected, its key components and the values people associate with these, and also of the amount of biodiversity that will be lost through the project.
- Establish the most appropriate biodiversity to be conserved through the offset. This entails an analysis of the biodiversity affected, including identification of key biodiversity components. A decision is then needed whether to conserve the same ecosystem and habitat types through the offset (and within them, any special care needed to benefit key biodiversity components), or whether there is justification for conserving biodiversity in different kinds of ecosystem that will generate conservation outcomes of higher priority.
- Identify suitable options for the activities and areas to be involved in the offset. Compare these, and define the final offset.
- Determine the roles and responsibilities of the range of stakeholders who will be involved in the implementation of the offset. Establish appropriate legal, institutional and financial arrangements. Build adaptive management, monitoring and evaluation into a long-term work plan or business plan for the offset.
- Implement the biodiversity offset, and monitor, evaluate, and manage it adaptively.
- All of this is done by the developer, working with stakeholders such as local communities, local experts and government, and sometimes drawing on international expertise.

Each of the pilot projects is part way through this process, and they are working on the design of their biodiversity offsets at the same time that BBOP is developing its set of principles and toolkit of methodologies and guidelines. The pilot projects have thus not been able to benefit from clear, complete methodologies available to them from the start of their offset design processes, but they have been using the draft tools when available and appropriate, and their experiences are contributing to the development of the toolkit. The following Fact Sheets often refer to elements of the BBOP Biodiversity Offset Design Handbook, an outline of which appears on pages 14-18. In addition, BBOP has identified a set of 'Key Questions' (below) that may help the developer of a biodiversity offset check whether the offset will accord with emerging best practice. Several of the Fact Sheets outline how the pilot projects are planning to answer these Key Questions.

Box 3 : Key questions to help biodiversity offset planners

1. No Net Loss: Is the biodiversity offset designed to achieve no net loss of biodiversity, or a net gain?
2. Mitigation Hierarchy: Did the developer follow the mitigation hierarchy and only employ the biodiversity offset to compensate for residual damage remaining after reasonable opportunities to avoid, minimize and rehabilitate impacts had been taken?
3. Key Components: Are all the key biodiversity components impacted by the project identified and covered by the offset?
4. Amount: Did the developer calculate the amount of biodiversity lost through the project and gained by the offset?
5. Options: Did the developer identify and evaluate a range of options for offset sites and activities?
6. Stakeholders: Did the developer engage stakeholders appropriately in offset design and implementation?
7. Sustainability: Did the developer design financial and institutional arrangements for the offset to secure its long-term success?
8. Transparency: Is the developer providing access to information on the biodiversity offset to independent observers, to enable the quality and success of the offset to be assessed?

	PEARL GTL PROJECT, QATAR
BUSINESS & BIODIVERSITY OFFSETS PROGRAMME PILOT PROJECT FACT SHEET, MARCH 2008	

1. Project summary

Company	Qatar Shell GTL
Operation	Pearl Gas-to-Liquids (GTL) Project
Location	Ras Laffan Industrial City Complex (RLIC), Qatar (see Figure 1)
Project activity	Development of gas resources in a portion of Qatar's North Field gas reserves and a gas to liquids (GTL) processing facility at Ras Laffan Industrial City (RLIC). Project comprises: two offshore unmanned wellhead platforms and associated wells approximately 70km from RLIC; two offshore pipelines transporting wellhead gas and fluids to shore; a GTL plant at RLIC that will produce approximately 140,000 barrels of GTL products/day and 120,000 barrels of oil equivalent per day of condensate & liquefied petroleum gas.
Impact area	824.5 hectares of land comprised of sandy / silty, rocky, sabkha, salt marsh and sand beach habitats. Marine impacts around 70km pipeline & platforms, & shared harbour use.
Offset area	Terrestrial – yet to be determined; Marine – yet to be determined
Offset activities	Work has started on the design of the potential terrestrial biodiversity offset. Work on the potential marine biodiversity offset will start shortly. The most likely location for the terrestrial offset will be within the newly established Al-Reem Man and Biosphere (MAB) Reserve. Potential activities there include establishing a network of core conservation areas; temporary habitat protection measures to enhance regeneration of vegetation and enhance connectivity between cores; community based management; and supporting capacity development, monitoring and evaluation. In addition, remediation measures inside RLIC could create 'reserves' for non-offsetable truffle species, and help maintain a sub-sample of former biodiversity on site at RLIC.
Partners (design phase)	Supreme Council for the Environment and Natural Reserves (regulator); Qatar Petroleum; UNESCO; IUCN; Qatar University; independent specialist consultants and contractors.
Partners (implementation)	To be confirmed (likely to include senior partners SCENR and UNESCO).
Start of offset project	February 2006

2. Rationale for offset

A pilot biodiversity offset offers Qatar Shell GTL (Qatar Shell) a unique opportunity to contribute to the development of an innovative concept that could have substantial enduring benefits to conservation in Qatar and the region, and thus business benefits for Shell. For the Pearl GTL Project, terrestrial biodiversity impacts were largely impossible to minimize, due to the complete land clearance required on the small site occupied by Shell. A voluntary biodiversity offset enables the company to take responsibility for its impacts and plan an offset aiming to achieve no net loss of biodiversity. This aligns well with Shell's Biodiversity Standard[1]; demonstrates Qatar Shell's commitment to Qatar's environment and should help to strengthen relationships with regulatory authorities. An opportunity exists to develop the offset's terrestrial element in the core zone of the Al-Reem Man and Biosphere (MAB) Reserve, building on Qatar Shell's previous work with SCENR and UNESCO to establish the Reserve formally and financial support for the MAB proposal for this secured conservation area.

[1] See www.shell.com/home/content/envirosoc-en/environment/biodiversity/our_approach_to_biodiversity/biodiversity_standard_000407.html

2. Local environment

The Pearl GTL project and RLIC lie within the Arabian Gulf desert and semi-desert ecoregion. Terrestrially, the habitat types at RLIC are sandy/silty; rocky; sabkha; salt marsh; and sand beach. The Pearl GTL is within the RLIC original fence line and has been protected from virtually all anthropogenic disturbances for approximately 17 years. Both green and hawksbill turtles nest along the RLIC beaches to the north of the Pearl GTL project site and are also found in the marine environment. The offshore environment contains fringing reefs occur along the north and the east coast, while the Arabian Gulf is home to the second largest population of dugongs, a number of whale species (Bryde's whale, humpback whale and killer whale) and dolphin species (Indo-Pacific humpback dolphin, Indo Pacific bottlenose dolphin, bottle nose dolphin and the spotted dolphin) and five species of sea snake. The offshore area has traditionally been used for fishing. Within RLIC, the main threats to biodiversity are from land clearance associated with projects such as Pearl GTL and its neighbours and their shared infrastructure[2] (e.g. roads). More broadly, Qatar's desert biodiversity is threatened by habitat conversion for development, overgrazing, hunting and impacts such as increasing tyre tracks from recreational driving.

Foreign workers with temporary residence status comprise about 80% of the total population of Qatar, and thus the fishing communities of Al Khor (the nearest town to RLIC) comprise migrant workers working fishing boats owned by Qataris.

3. Key Biodiversity Components

The project site is a favorable but not unique habitat for any of the mammal species identified there. The reptile community is moderately diverse, with provincial importance. RLIC lies within the migratory route of the Houbara bustard, listed as Vulnerable (IUCN Red List) due to its rare breeding status. It is a rare winter (January-March) visitor to Qatar, but has not been observed at RLIC. Further studies are planned to identify the key marine biodiversity components, which will then be added to the matrix below, which for the moment only addresses terrestrial components:

Biodiversity	Intrinsic values	Use values	Cultural values
FAUNA			
Bird Species (resident)			
• Houbara Bustard	• Vulnerable species (global)	Traditional hunting	High – a primary quarry of falconers
• Chestnut-bellied Sandgrouse	• Vulnerable species (local)	Traditional hunting	High
Mammal Species			
• Desert Hedgehog	• Vulnerable species (local)	-	
• Cape Hare	-	Traditional hunting	High
Reptiles			
• *Uromastyx aegyptia*	-	Traditional hunting	High
• *Stenodactylus khobarensis*	• Localized irreplaceability	-	-
• *Chelonia / Eretmochelys*	• EN / CR	Traditional hunting	Moderate
FLORA			
• Foliose (lichen)	• Localized irreplaceability	-	-
• Crustose (lichen)	• Localized irreplaceability	-	-
• Desert Truffles (fagga) of the *Terfezia* or *Tirtnania* genera	• Localized irreplaceability	Traditional collection – nutritional value, and medicinal properties.	High – lucrative cash crop for local people.
HABITATS			
• Sand & rock desert	-	• Traditional hunting and	Moderate

[2] For offset purposes, the camp built for the +40,000 construction workers has not been considered.

		grazing	
• Beach	-	• Recreation	High
• Saltmarsh	• Localized irreplaceability	-	-
• Mangrove	• Localized irreplaceability	-	-
ECOSYSTEM SERVICES			
• Seed bank	• Localized irreplaceability	-	-
• Soil stabilization	• Localized irreplaceability	-	-
• Wildlife habitat	• Localized irreplaceability	-	-

From these key components, the only "non-offsetable" element is the desert truffles (*fagga*). It is reported that the RLIC area is the most important truffle area in Qatar with 4 species present as opposed to only 2 found elsewhere in the country. As an alternative to offsetting, it is proposed that one or more *fagga* reserves be established in the RLIC site to maintain the truffle population.

4. Predicted impacts

The predicted impacts primarily relate to the loss of terrestrial and coas tal habitat[3]. In the evaluation shown below, it is assumed that there will be no residual biodiversity value after construction activities due to land clearance[4]:

Habitat types	Actual Project Area (ha)	Direct Impact (ha)	Indirect Impact (ha)
Sandy / silty	343.0	331.6	11.4
Rocky	316.9	306.3	10.6
Sabkha	161.1	158.1	3.0
Salt marsh	2.0	2.0	0.0
Sand beach	1.5	1.5	0.0
TOTAL	**824.5**	**799.5**	**25.0**

5. Proposed offset

After consideration of a number of options (see below), the development of a terrestrial offs et in the Al-Reem MAB Reserve is proposed based on its biodiversity characteristics and its practical advantages. The location of the Reserve is shown on Figure 1. Parts of the Reserve are similar to the Pearl GTL impact site. The dominant soil type at the RLIC site is extremely limited in distribution, with the only other known location in Qatar being found in the Reserve. As the dominant factor determining habitat type in Qatar is probably the underlying substrate and the soil type (in the absence of major altitudinal or rainfall variation) the similarity of soil types at the two sites is extremely significant. The location of this soil type in the Reserve falls within a fairly large contiguous stretch of habitat, which is lightly inhabited and moderately/heavily degraded by grazing (and therefore offers the potential for biodiversity gains to offset losses at the impact site). Other practical and conservation advantages of locating Qatar Shell's offset in the Reserve are:

- As noted above, Qatar Shell has an interest and involvement in the MAB Reserve.
- If SCENR wished to expand the use of biodiversity offsets in Qatar, a conservation bank could be set up in the Reserve to sell credits to offset other industrial developments or even to offset the entire impacts of RLIC (an idea promoted by UNESCO).
- The MAB Programme links sustainable development, improved local livelihoods and biodiversity conservation, mirroring the role of sustainable livelihoods in successful biodiversity offsets.
- Support for the conceptfrom the Secretary-General of SCENR Dr. Khaled bin Ghanem Al Ali during his meeting with the BBOP team in December 2007.

On the basis of similarities with the impact site, habitat recovery opportunities and other practical advantages, the general area east/south-east of Dohat Faishakh in the south of the Reserve has been

[3] The (indirect) impact issues relating to the existing port facilities and the current port expansion, including the dredging of marine substrates, will be addressed in a separate study on marine offsets.

[4] In practice, remediation measures at the Pearl GTL plant may be able to maintain at least a sub-sample of former biodiversity, but these have been discounted to give a 'worst case' impact scenario.

provisionally selected to locate the offset. This site is located within one of the two core zones currently identified in the Al-Reem MAB Reserve; these core zones are likely to be modified with the development of a more detailed management plan for the Reserve.

The principal terrestrial offset activities in the Reserve will involve a combination of technical and physical interventions and socio-economic community-based measures. The terrestrial offset design strategy is likely to focus on preventing and reducing detrimental activities (e.g. vehicle traffic and grazing), leaving natural processes to restore vegetation / other habitat components: establishing a network of core areas functioning as a permanent biodiversity store that supports landscape-wide restoration interventions; temporary habitat protection measures to enhance regeneration of vegetation and connectivity between cores areas; community based management to enhance prospects of sustainable biodiversity offset; information and education Programme – at institutional, local and general public / user levels; capacity development to enhance implementation of interventions; monitoring and evaluation to capture feedback from this early pilot in the BBOP Programme.

Options for locating a marine offset area along the Qatari coast have not yet been evaluated in detail. One option is the marine and coastal areas included as part of the Al-Reem MAB Reserve. The Fuwairit beach and offshore area is also a possible marine offset site due to its proximity to the impact site (Figure 1) and general similarity/practicality for use in hosting displaced coral patches from RLIC.

6. Key Questions addressed in the offset process for the pilot project

No net loss: The amount of biodiversity lost due to the project (including from indirect impacts) has been calculated and will be matched through sufficient gains in biodiversity at suitable terrestrial and marine offset. Offset gains required will be based on a 'worse case' loss at the impact site (i.e. possible residual biodiversity has been discounted).

Mitigation hierarchy: Project development involved the total removal of vegetation and other associated biodiversity in most site areas. Mitigating efforts to relocate shrubs greater than 0.5m in height were largely unsuccessful due to their extensive lateral or tap root systems; more effective was the storage of soil scraped from the site as a seed bank of native plants.

Key Components: The key terrestrial biodiversity components noted in section 3 were identified through extensive baseline studies. The proposed terrestrial offset area offers the potential for gains in these components, complementing general ecosystem / habitat gains within the offset area.

Amount: Calculation of biodiversity losses (impact site) and gains (offset site) was undertaken using draft BBOP methodologies to ensure the proposed offset location (and related interventions) can deliver sufficient conservation gains to achieve no net loss. This approach considers biodiversity of equivalent or higher value and site selection to ensure all key biodiversity components are represented at the offset, while determining the necessary scale for the offset that goes beyond simple area-based metrics. Key attributes were identified for each of the 5 habitat types and used to calculate the pre-project biodiversity 'condition' of the impact site. Development was assumed to have caused the loss of all biodiversity value. The offset location and area required to replace the lost biodiversity values will vary depending on the degree of biodiversity enhancement at the offset site and other factors (such as government priorities, and practical issues such as land tenure and the prospects for long term success). Based on preliminary calculations, offset areas where lower levels of biodiversity enhancement would be needed may require an offset area of around 10 times the impacted area, while offset areas where higher levels of enhancement would be needed may require a smaller offset (around double the size of the impacted area).

Options: Soil maps, satellite images, expert opinions, field reconnaissance and literature reviews were to identify and evaluate potential offset sites. Options immediately adjacent to RLIC were discounted due to extensive development and land tenure issues. Options close to RLIC – coastal areas just north-west of RLIC at Fuwairit, Al Ghariyah and further north – were proposed but excluded due to habitat differences and land tenure issues. However the Fuwairit site (an important turtle nesting beach) could represent an optional marine offset site, subject to future marine evaluation. The most promising, practical options for the establishment of enduring biodiversity offsets would lie in secured conservation areas in other parts of Qatar. Figure 1 shows options that could offer opportunities for terrestrial and marine / coastal offsets and which have equivalent or higher conservation value than the impact site:

- Al-Reem MAB Reserve, northwest Qatar (1750 km^2 and adjacent coastal / marine areas).

- Khor Al-Odaid, identified as a potential World Heritage Site but under serious threat from overuse by visitors, refuse and vehicle impact on the terrain.
- Al-Thakhira Marine Protected Area (land: 75-100 km^2); coastal / marine area (300-500 km^2).

Based on biological and practical considerations (noted above) the MAB Reserve has been selected as the terrestrial offset location. Further work will define the marine offset location.

Stakeholders: As part of the Environmental, Social and Health Impact Assessment process, meetings were held with the SCENR, RLIC and Qatar Petroleum. A survey of attitudes towards the GTL project was undertaken in and around RLIC, Al Khor and Al Dhakira. Social, economic and health data were also collected from regional and international sources. These and other stakeholders (including UNESCO) are being consulted during the offset design phase, and appropriate organizations to collaborate in the implementation will be identified.

Sustainability: The success of the terrestrial offset will be linked to the Reserve's success, which will be conditional on appropriate institutional arrangements (administrative, regulatory, technical and financial) being in place. This will require Shell Qatar's sustained direct support and advocacy, and possibly consideration of an appropriate funding mechanism.

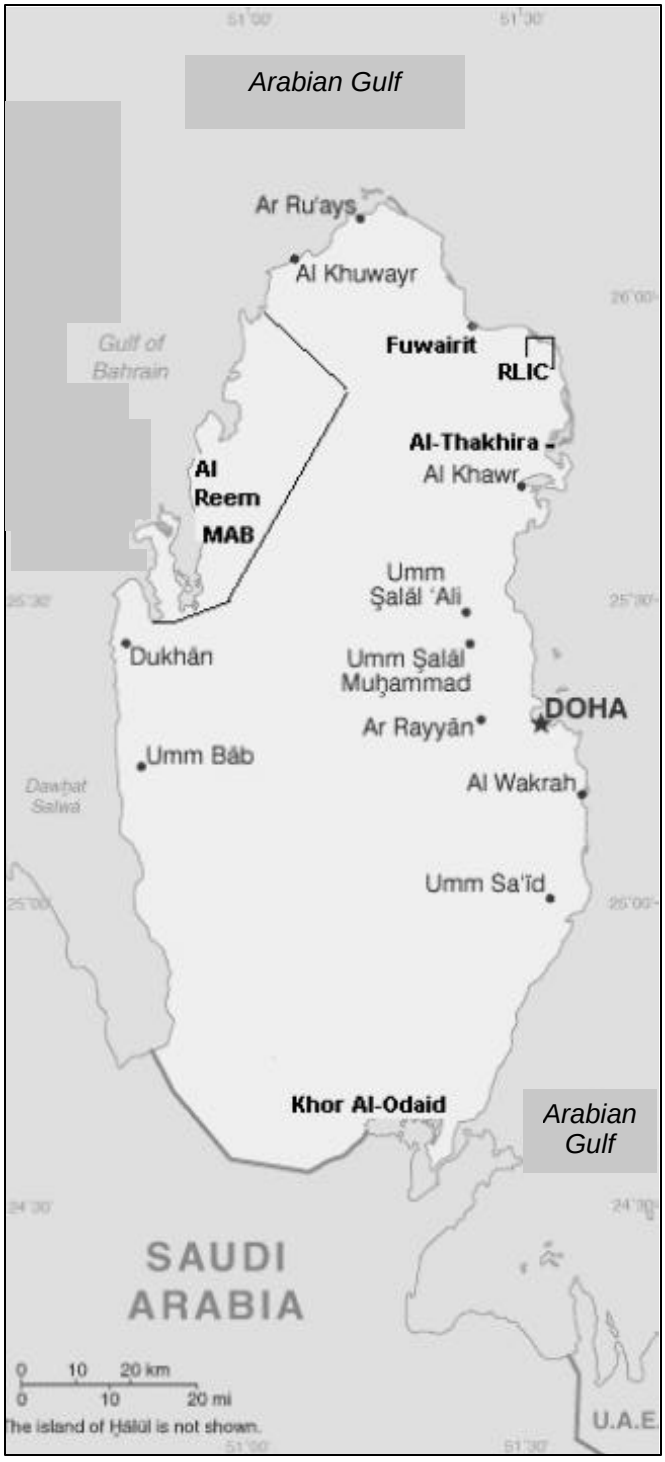
Transparency: The calculated biodiversity losses and gains have been written up in a comprehensive report "*Towards a Biodiversity Offset for the Pearl GTL Project, Qatar: Benchmarking, habitat area calculations and initial offset ideas*", prepared in January 2008.

7. Gaps in current offset planning & implementation process and proposed next steps

Aspect	Issue	Proposed Solution
Company (internal)	▪ Progress for the Shell Qatar offset process to date has been sporadic. ▪ Awareness about the offset process within GTL needs to be raised.	▪ A dedicated resource person in the Pearl GTL project office is needed to manage the process.
Stakeholders (external)	▪ Key stakeholders have no prior experience with the offset process.	▪ Create an advisory body from key stakeholders to steer the offset design process and facilitate offset implementation and financing.
Financial	▪ Cost of offset implementation is unclear. ▪ Opportunities for co-financing have not yet been explored.	▪ Complete technical assessments (marine offset process is a priority). ▪ Compile business plan for terrestrial offset. ▪ Identify additional sources of income / co-financing opportunities.
Sustainability	▪ Mechanisms for ensuring long-term/in perpetuity success of the MAB Reserve need to be developed.	▪ Consider funding mechanisms such as a conservation trust fund, where government funds match private sector offset funding.

Proposed next steps for 2008 include: appointment of a project manager; conducting marine habitat assessments to assess impacts and identify potential marine offset sites and marine interventions; continued engagement with local stakeholders (SCENR, UNESCO, scientific community and local community) on local and regional priorities for biodiversity and consult on offset options; integration of offset design with the Reserve's management planning process; design of offset interventions (terrestrial and marine), including both core activities and supportive measures (that will help create an enabling environment for a successful offset); establishment of a monitoring and evaluation Programme for the offset; seek and gain approval of offset design and implementation plan by Qatar Shell management.

Figure 1. Map of Qatar showing the location of Ras Laffan Industrial City (RLIC) and Al-Reem MAB Reserve



NEWMONT. The Gold Company

THE AKYEM PROJECT, GHANA

BUSINESS & BIODIVERSITY OFFSETS PROGRAMME PILOT PROJECT FACT SHEET, MARCH 2008

1. Project summary

Company	Newmont Ghana Gold, Ltd
Operation	Akyem Project
Location	Akyem, Birim North District of the Eastern Region of Ghana
Project activity	Development of the Akyem project will involve development of an open pit mine, construction of a waste rock disposal facility, tailing storage facility, ore processing plant, water storage dam and reservoir, water transmission pipeline, environmental control ponds and ditches, haul and access roads, and support facilities.
Impact area	Approximately 1,875 hectares (ha) would be required for mine development, buffer zones, and resettlement villages. The mine will disturb 71 hectares located within the Ajenjua Bepo Forest Reserve for development of the open pit.
Offset area	Yet to be confirmed. A potential candidate offset site has been identified as the Mamang Forest Reserve, just south of the proposed project area, which is of a similar ecosystem type of as the proposed project area – moist semi deciduous forest.
Offset activities	Yet to be confirmed. In consultation with stakeholders, but likely to include management interventions to improve the conservation status of biodiversity and arrest degradation at the Mamang Forest Reserve. Activities are also likely to include working with local communities on identifying and evaluating the potential propagation of medicinal plants for community use.
Partners (design phase)	Current Partners include Conservation International. Future partners will likely include the Forest Services Division, Forestry Commission and communities within the direct footprint area.
Partners (implem-entation)	Future partners have been identified and may include the Ministry of Lands, Forestry and Mines, Environmental Protection Agency, Forest Services Division, Forestry Commission, Forest Research Institute of Ghana, Chamber of Mines, Akyem Kotoku Traditional Authority, Community Chiefs/Elders, New Abirem District Assembly
Start of offset project	The Akyem project was adopted by BBOP as an offset pilot project in December 2004. The project was proposed by Newmont in recognition of the interest in the Forest Reserve and related project impacts.

2. Rationale for offset

Newmont Mining Corporation is committed to environmental stewardship and to building and maintaining relationships with communities in areas where they operate. As part of its corporate environmental and social responsibility framework, Newmont is developing a corporate level strategy on biodiversity, one component of which involves researching biodiversity offsets as tools for conservation. Newmont recognizes that utilizing biodiversity best management practices can support companies in securing their license to operate, helping improve relationships and local people, and helping them secure access to land and capital. Newmont also recognizes the interests expressed by various local stakeholders related to biodiversity impacts associated with the Forest Reserve component of the Akyem project, and is therefore committed to engaging with appropriate local, regional, national and international stakeholders in order to determine an appropriate mitigation mechanism relative to the potential impacts of the project.

3. Local environment

The proposed project area is located in Ghana (130km northwest of Accra) within Upper Guinea Forest Hotspot which stretches from Guinea to Cameroon. This area lies within the Moist Semi-deciduous Zone and is characterized by steep hills and an undulating landscape with elevations ranging from 155 meters (m) to over 295 m above mean sea level. The proposed project area is primarily a complex of agricultural lands from which the original forest has been removed and is located on the southern boundary of the Ajenjua Bepo Forest Reserve, with a portion of the ore deposit located within the Forest Reserve

boundary. This reserve, established in 1930, is classified as moist semi-deciduous forest with a total area of 569 hectares (ha). The portion of the Ajenjua Bepo Forest Reserve that would be affected has been significantly damaged or destroyed by encroachment of local subsistence farmers, intensive logging, and establishment of plantations of non-indigenous trees. Other threats to biodiversity in this area also include invasion of noxious weeds; bushmeat hunting and artisanal mining which have been occurring in the area previous to Newmont Ghana's mining interests.

This proposed project area is located in the Birim North District, which has a population of about 123,579 (2000 Pop. Census). The district has a lower population density (99 persons per km^2) than the average for the region of 109 persons per km^2, reflecting the prevalence of relatively small size settlements in the district. Within the direct footprint of the project, there is one settlement – Yayaaso (with a population of about 570 residents), as well as a number of hamlets/farmsteads/homesteads – Nyamebekyere, Kerenkeren, Kwasi Kpofor, Badu, Kofi Aklo, Ayesu Zigah, Yaw Tano and Metemano.

4. Key Biodiversity Components

While a biodiversity offset aims to offset all the biodiversity impacted by a project, it is important to pay particular attention to key biodiversity components found in the area affected by the project.

The proposed project area is primarily a complex of agricultural lands from which the original forest has been removed. The portion of the Ajenjua Bepo Forest Reserve that would be affected has been extensively logged, converted to crop land, or planted with non-native timber species. The structure and composition of habitats in the project area have been extensively modified by human activities and primarily support wildlife species adapted to high levels of human activity (i.e., "generalists"). Species of conservation concern (key biodiversity components) defined by vulnerability and irreplaceability criteria recorded in the project impact area (e.g. Zenker's fruit bat, green-tailed bristlebill, and Maxwell's duiker) are typically associated with forest habitats but forage in adjacent agricultural land and patches of fallow re-growth. All species of conservation concern in or near the project area are widespread in the Upper Guinea Forest of West Africa. Several species of trees present in the project area are classified on the IUCN Red List as "Vulnerable". These species are common, widespread timber species in Ghana but are under pressure because of their high economic value.

5. Predicted impacts

Construction and operation of the proposed mine and ancillary facilities would directly affect about 1,466 hectares of land through removal of vegetation, soil, and subsoil. Of this total area, approximately 71 hectares of the open pit facility would be located in the Ajenjua Bepo Forest Reserve (ABFR). The area of the ABFR which would be impacted is a 'Condition Score 4' forest (heavily degraded) and consists of non-native cedrela plantations (18.1 hectares), cocoa farms (1.1 hectares), fallow (0.2 hectares), and secondary forest (51.5 hectares). Secondary forest in ABFR that would be affected has been classified as a 'Condition Score 3' forest (characterized as slightly degraded) and secondary forest that would be affected outside of the ABFR is 'Condition Score 4' forest (characterized as mostly degraded). The remaining 979 hectares of the project footprint would affect oil palm (254 hectares), cocoa (380 hectares), fallow (115 hectares), secondary forest (73 hectares), food crops (127 hectares), citrus (20 hectares), teak (1 hectare) and wetlands (<1 hectare). Following the closure of the mine, the majority of the project area will be reclaimed and rehabilitated resulting in minor residual long-term impacts.

6. Proposed offset

The nature and exact location of the proposed biodiversity offset are still being defined by the pilot team in consultation with stakeholders, but the primary candidate offset site has been identified as the Mamang Forest Reserve, located directly south of the proposed project area. The Mamang Forest Reserve is a moist semi-deciduous forest and is ranked as a 'Condition Score 2' forest, meaning 'good' according to Ghana's Forest Services division. This can be compared to the Ajenjua Bepo Forest Reserve that will be affected by the project, which has a rating of 'Condition Score 4' forest, meaning that it is 'mostly degraded'. The conceptual offsetting activities identified at this time potentially include the following activities.

- Strengthening the management of Mamang Forest Reserve by increasing the patrolling and enforcement of local regulations by both the Forest Department and rangers from local communities; and establishment of activities such as nurseries with local communities to address underlying causes of biodiversity loss in the area (land clearing for medicinal plants and fuelwood).
- Establishing and maintaining clear boundary distinctions to monitor "edge effect" encroachment to provide early warning and focused interventions.

- Retarding or preferably stopping degradation that is currently occurring by, for example, stopping an inappropriate grazing regime, controlling pest plants or animals, re-instituting an appropriate fire regime, stopping illegal use of resources, increasing guard patrols, stopping soil erosion, reducing water turbidity, etc.
- Averting the proven risk of damage from a future event, for example, by entering into a conservation easement so landowners give up (possibly in return for payment) the right to undertake in the future certain destructive activities, such as habitat conversion.
- Evaluating the connectivity potential to other area Forest Reserves to increase "effective" habitat for forest species.

7. Key Questions addressed in the offset process for the pilot project

No net loss: The principle of no net loss for this offset pilot project is being pursued by calculating the amount of biodiversity that will be lost through the mine development and by designing and executing an offset strategy ensuring sufficient gains in biodiversity in the close vicinity of the mine. The offset design will also ensure that the offset is located in a suitable site that will deliver additional conservation outcomes focused on the key biodiversity components associated with the area affected by the project

Mitigation hierarchy: The project plans to use a number of best practice management standards to minimize the overall project impacts on biodiversity, including: surface water management and sediment control structures; run-on and run-off diversion control ditches; and monitoring. Reclamation efforts are also planned as part of the mitigation strategy. Residual impacts on the flora would result predominantly from the presence of the open pit mine (potentially up to 115 hectares). Other disturbed areas would be reclaimed to their previous land use, resulting in either native vegetation or agricultural land. Losses in productive capacity of the lands affected by mining could also be mitigated or compensated by improving sustainable food and cash crop production among local farmers through activities such as:

- Training in sustainable food and cash crop production;
- Training in sustainable livestock and aquaculture systems;
- Provision and facilitation of access to agricultural inputs (e.g., fertilizer & seed), equipment & tools;
- Training in participatory farm management and agri-business development and marketing;
- Bio-intensive gardening;
- Crop diversification and cash crop production;
- Improved marketing of agricultural products.

Key Components: It is important to identify the key biodiversity components that will be affected by the proposed mine so that the significance and extent of the overall project impact can be a dequately assessed and the offset can be designed to deliver conservation gains focused primarily on the key components, complementing more general gains for the broad habitats represented at the offset site. Key biodiversity components have been described in section 3. Selection of sites and activities that can deliver conservation gains for these key components will be a criterion for the offset design.

Amount: In addition to identifying the key biodiversity components affected by the proposed project, which will be the offset focus, it is important to establish the amount of overall biodiversity that will be lost, and thus the amount of biodiversity (in terms of level of gain, area and scale) needed to achieve no net loss. The pilot is employing an accounting approach from the Draft BBOP Offset Design Handbook. This approach, which is a modified version of the habitat hectares approach (developed in Australia), uses an independent benchmark site that is as "pristine" as possible as the basis of comparison for with the impact site both before and after the project impact is being used to quantify the amount of biodiversity lost through the project. A similar approach will be taken to quantify the amount of biodiversity gained by the offset. At this stage, the pilot is evaluating the set of attributes, outlined below, which have been identified for the mine pit area, in order to calculate a current amount of biodiversity for that area prior to the project as well as the expected amount once the project's impact has taken place. A similar provisional calculation has also been made for the potential offset sites in terms of their current amount of biodiversity and the potential amount that could be achieved with better protection and management through the offset. Once the calculations are complete for the mine pit area, they will be conducted for the remaining impact areas.

Benchmark attributes under evaluation for the mine pit:

Structural

- Forest Condition Class (Hawthorne and Abu Juam, 1995).

- Patch size (hectares of intact forest).
- Number of large trees/hectare (trees > 30 centimetres (cm), diameter at breast height (dbh)).
- Number of trees/snags/hectare (trees/snags >30 cm dbh with cavities).
- Density of streams (ephemeral/perennial) (kilometres/square kilometre [km/sq. km]).
- Proximity/connectedness of Benchmark site to forest reserves.

Compositional

- Genetic Heat Index (genetic diversity based on species composition).
- IUCN "Vulnerable" plant species more than 30 cm dbh.
- Human population density within 5 km of Benchmark site (demand for bushmeat and other biological amenities).

Functional

- Habitat for forest-dependent fauna species.
- Termite colonies/hectare (organic matter recycling/soil enrichment).

Options: A number of options for potential offset areas and activities are being assessed and compared. The selection of a suitable offset site is influenced by biological considerations, such as similarity of the ecosystem, so that the key biodiversity components affected by the project can be benefited by the offset, and an assessment of the potential gain, in terms of conservation additionality that the offset could generate. In addition, a number of other factors are taken into consideration, such as communities' preferences, government's priorities, and practical issues such as land tenure and the chances of long term success.

Stakeholders: A broad range of different stakeholders have been engaged during the biodiversity assessment phase of the process. At the community level, a cross section of individuals from the Yayaaso settlement and the 8 surrounding hamlets in the direct footprint area have participated in focus groups to better understand the importance of their surrounding natural environment and how biodiversity is being used. Results of these surveys are reflected in the "Key Biodiversity Components Matrix" in section 4. At a district level, the pilot team has met with the Birim North District Assembly to better understand their plans with regard to district level planning, and see how biodiversity conservation planning could be integrated into that process. At the national level, a workshop was held with members of the Chamber of Mines, Ministry of Lands Forestry and Mines, Environmental Protection Agency, Forest Services Division, Forestry Commission, Forest Research Institute of Ghana, to introduce the concept of biodiversity offsets and discuss the challenges and opportunities for integrating biodiversity offsets into a sustainable development framework in Ghana. The pilot team has also worked with local scientists who conducted biodiversity assessments in the project area to better understand the biodiversity context of the area.

Sustainability: The Akyem biodiversity offset is still at a fairly early stage in its design, so the precise legal, institutional and financial arrangements to cement the relationships of the key stakeholders involved in its successful implementation in the long term have yet to be determined. However, those involved in the offset design are exploring the full range of options, from trust funds to sustainable business ventures, several of which would likely involve working with local communities.

Transparency: This Fact sheet is one of many documents that Newmont and its partners have prepared to communicate information about the Akyem project, the evolving design and implementation of the biodiversity offset and Newmont's approach to the management of social and environmental impacts. The company is committed to seeking the best advice on the design of the biodiversity offset and to sharing information on the plans for the offset and their progress.

8. Proposed next steps

As described above, Newmont has made considerable progress with understanding the nature of the Akyem Project impacts on biodiversity and the amount of residual biodiversity loss to be offset. A number of options for potential offset sites are being considered and one (the Mamang Forest Reserve) is emerging as the most appropriate, both in terms of securing appropriate biodiversity gains at the necessary scale and in terms of local communities' support and interests The next steps are to involve local stakeholders in more detailed discussions about the potential offsetting activities and locations and to explore issues related to implementation, including defining roles and responsibilities of various stakeholders and establishing appropriate legal, institutional and financial arrangements for the offset.

ANGLO PLATINUM	**POTGIETERSRUST PLATINUMS LIMITED (PPRUST), SOUTH AFRICA**
BUSINESS & BIODIVERSITY OFFSETS PROGRAMME PILOT PROJECT FACT SHEET, MARCH 2008	

1. Project summary

Company	AngloPlatinum
Operation	Potgietersrust Platinums Limited (PPRust)
Location	Overysel-Zwartfontein farms, Limpopo Province, South Africa
Project activity	Expansion of the existing mine. Open-cast mining of platinum ore (pit ca. 400 ha), concentrator complex (ca. 50 ha), waste residue facilities (1,412 ha), tailings dam (300 ha) and infrastructure (100ha). The expanded mine will produce up to 1 million kilotonnes per month of platinum bearing ore that will be processed on site before being transported to a local smelter for further beneficiation.
Impact area	2,413 ha of Makhado Sweet Bushveld (according to Mucina & Rutherford 2006 classification) in the Savanna Biome.
Offset area	5,398 ha of Makhado Sweet Bushveld, Central Sandy Bushveld and Waterberg Mountain Bushveld in the Savanna Biome.
Offset activities	Game reserve with re-stocking of indigenous ungulate component, improved protection and active range management and rehabilitation.
Partners (design phase)	School of Molecular & Life Sciences at the University of the North on behalf of the appointed consultants, SRK Consulting Engineers & Scientists (EIA); Golder Consulting; Anglo Technical Services; Botanical Society of South Africa (conservation NGO & Anglo partner); Dr Marc Stalmans (consulting ecologist).
Partners (implementation)	Social, Health and Environment (SHE) department of AngloPlatinum (game reserve management staff); Ekofocus Wildlife Consultants (wildlife management consultants); Dr Marc Stalmans (consulting ecologist).
Start of project	2005

2. Rationale for offset

The business case for the mine's decision to agree to invest in a biodiversity offset has been driven mainly by the desire to assist the local communities in improving their quality of life in a sustainable way. With the high unemployment rates in the region and a lack of conventional employment, the community has to look at alternative ideas to generate an income. The mine and offset areas are in close proximity to the Waterberg Biosphere Reserve, which is a popular tourist destination for both local and international tourists. The potential exists to tap into this market. At the same time, the mine's management wants to prevent the further expansion of degraded areas that are resulting from the community's over-utilization of the natural environment.

The Savanna Biome (in which the mine is located) is in itself not a threatened or sensitive biome. However, over-utilisation of the area through human activity such as wood collection, grazing and dryland crop production has had a significant impact on this biome. High unemployment rates in the area place further pressure on the already degraded ecosystem as people remain dependent on the local biodiversity for their survival needs. For these reasons, the conservation status of the remaining undisturbed areas has increased.

3. Local environment

Main land uses:	Peri-urban settlement, subsistence dry-land farming, communal livestock grazing (cattle & goats), other natural resource utilization (firewood)
Community make-up:	Medium to large-sized villages in a peri-urban context (that is to say, relatively densely packed but still with a large yard where some dry-land cropping may take place). Unemployment rates are high. Employed residents work at the nearby mine or commute daily to the town of Mokopane (40 km). Some people work in the bigger cities of Johannesburg and Pretoria (200 km) and may only return on a weekly/monthly basis.

Generalised description:	The impact area is situated in the northern savanna area of South Africa with an annual rainfall of 500 to 600 m at an elevation of 1,080 to 1,300 m above sea level. Topography is generally gently undulating with some hilly outcrops. The 'natural' vegetation would have consisted of an open to closed woodland with a diverse tree flora that had a canopy height of 5 to 10 m. The area would originally (more than 200 years ago) have supported the full range of the typical charismatic African megafauna including lion, elephant, buffalo and rhino. These large species, except in Protected Areas and newly stocked private reserves, have generally disappeared from the landscape.
Current and potential threats to the landscape:	1. Expansion of peri-urban settlement (large influx of people to the many new platinum mines in the region); 2. Overgrazing by livestock; 3. Unsustainable harvesting of other natural resources (in particular firewood and medicinal plants); 4. Illegal hunting of small and medium-sized indigenous wildlife; 5. New mining projects.

The area has been very negatively impacted before the arrival of the mine by existing settlements and communal grazing practices. Therefore, the key biodiversity components have few elements left that are considered of great conservation importance.

Biodiversity	Intrinsic values	Use values	Cultural values
Animal species • Potential occurrence of Red Data species – not confirmed **Plant Species** • Potential occurrence of 5 Red Data species, but not confirmed • Large diversity in mountainous habitat • Hardwoods in *Acacia* and *Terminalia* w oodlands	• Rarity – conservation value (potential only – not confirmed) • Rarity – conservation value (potential only – not confirmed)	• Illegally hunted with domestic dogs • Medicinal use • Fire wood & construction wood	• Medicinal and magical plants
Habitats within the Makhado Sweet Bushveld vegetation • Microphyllous (*Acacia*) woodlands on clay; • Macrophyllous (*Terminalia*) woodland on sandy soils derived from granite; • Mountainous habitat; • Riverine habitat	• Potential habitat for 5 listed red data plants species (presence not observed) • *Rhus-Euphorbia-clerodendrum* w oodland and *Croton-Combretum* Woodland (Mohlotlo Hills) (mountain habitat)	Valued by local people for: • Residential area • Land for subsistence cropping; • Grazing and browsing resource for cattle and goats; • Firewood • Building wood • Thatch grass (roof covering) • Medicinal plants	• Habitat for medicinal and magical plants
Ecosystem Services Water catchment (limited role) Sandsloot watershed/ Mogalakwena river system	• Mountain habitat acts as biotic corridor between Waterberg and Pietersburg Plateau	The woodlands perform the following functions: • Water catchment (limited) • Carbon sequestration (limited in impact area due to low biomass)	

4. Predicted impacts

The predicted residual impacts following the application of the mitigation hierarchy mostly concern the loss of habitat, namely 2,413 ha of degraded Makhado Sweet Bushveld. On the social side, there is a considerable impact in that some 956 families have to be relocated. These and other families are also losing access to natural resources such as grazing and firewood at the impacted site(although these resources are being exploited in an unsustainable manner at present).

5. Proposed offset

The offset is twofold: firstly in the form of a largely social offset and secondly as a largely biological offset. The social offset consists of the construction of new houses for the displaced families and the provision of appropriate water, sanitation and road services. Further compensation in the form of land is also offered to make up for the loss of access to natural resources. Furthermore, the communities will

participate in the biological offset which does not form part of the compensation mentioned in the previous sentence.

For the biological offset, the areas surrounding the impact project area consist of communal lands that are not readily available as an offset. Private land further afield must be considered. Two farms that are already owned (but not mined) by Anglo provide a very suitable offset as they have comparable habitats. They, too, are no longer in pristine condition due to past land use practices.

The offsetting activities include the following: establishment of activities such as game farming (preceded by the re-introduction of some of the original megafauna), restoration of required fire regime, thinning of bush-encroached woodlands, rehabilitation of eroded road and tracks, removal of invasive alien species, planting of native species, and fuelwood lots with local communities to address underlying causes of loss of biodiversity in the area (poverty and overuse of timber for fuelwood).

The improved natural resource base will be used to support limited trophy hunting and the operation of a game lodge. The ownership of the lodge will ultimately be transferred to the local community within the framework of the Social Plan for the mine. This therefore ties the social and biological offsets together.

6. Key Questions addressed in the offset process for the pilot project

No net loss: The principle of no net loss was pursued in the offset by calculating the amount of biodiversity that will be lost through the mine development and by offsetting this through sufficient gains in biodiversity in the close vicinity of the mine.

Mitigation hierarchy: Avoidance - The planning process for the construction of the expansion project ensured that the project was planned in a way that would avoid activities taking place within 100m of the Mohlasane and Sandsloot rivers. Instead of constructing additional access roads to the project site, use was made of existing roads. All sites determined to be sacred sites by the local community were identified during the impact assessments and these have been demarcated and will be protected. Minimizing - the site to which the village will be relocated was also previously disturbed by human activities. The site was chosen for the new village to minimize the project's overall footprint on undisturbed land. Rather than developing a new smelter on site, the existing mine and expansion project make use of a smelter in Polokwane to beneficiate their concentrate. Mitigation – an environmental management plan with detailed management actions to mitigate environmental impacts was drawn up as part of the legally required Environmental Management Programme Report compilation.

Key Components: It is important to identify the key biodiversity components that will be affected by the mine so that the significance and extent of the project's impact can be adequately assessed and the offset can be designed to deliver conservation gains for these key components, complementing more general gains for the broad habitats represented at the offset site. Key biodiversity components have been described in section 3.

Amount: In addition to identifying the key biodiversity components affected by the project that need to be addressed by the offset, it is important to establish the amount of biodiversity that will be lost, and thus the amount (in terms of level of gain, area and scale) needed to achieve no net loss. The habitat hectare approach was used to quantify the amount of biodiversity lost through the project and gained by the offset.

The loss of habitat due to the mining expansion was calculated taking into the account the relatively degraded nature of the habitat. The potential gains in the offset area were calculated taking into account the improvement that can be made due to better management of the land. Furthermore, the 'averted risk' by better protection will prevent degradation and stem biodiversity loss that has already started to happen in the offset area due to illegal resource collection.

Six to ten attributes were identified for each of the four habitats to calculate a current biodiversity score as well as the expected score post impact. A similar calculation was made for the potential offset sites in terms of current score and potential score following better protection and management.

Options: The choices for the location of the 'offset' were severely constrained by the land ownership pattern in the area. Most of the land is communally owned and not available for purchase. Two adjoining already owned (but not mined) by Anglo provides a very suitable offset having comparable habitats.

Summary table (in habitat hectares) of losses at impact site and gains at offset site

Habitats	Impact Area Total loss (ha)	Offset Area Total gain (ha)	Balance (ha)
Woodlands on clay flats	401	831	430
Woodlands on sand flats	81	108	27
Woodlands in mountainous terrain	265	107	-158
Riverine woodlands	51	55	4

Three of the four habitats are sufficiently offset. There is a considerable gain for the woodland on clay flats. This is quite important as those particular woodlands, although not very diverse, are under great pressure because of their suitability for cultivation and grazing. There is a shortfall of 158 habitat hectares for the mountainous habitat. This shortfall is not considered to present a serious negative conservation impact. This mountainous habitat is very well conserved in the adjoining Waterberg Biosphere. Support of the Limpopo Tourism & Parks Board on the nearby Witvinger Nature Reserve would benefit a similar habitat.

Stakeholders: The different stakeholders were identified during the EIA process. The most relevant stakeholders in the offset selection process were the local villagers who were either relocated or given alternatives for natural resources lost through the mine expansion. The mine has a very well structured system dealing with communities on an ongoing basis. This system was used to ensure that the relevant people and issues were identified and addressed.

Sustainability: The offset was previously acquired by Anglo and there is no cost attached to acquiring the land. PPRust is providing the operational budget for the staff, equipment and work required to protect and manage the offset. Anglo is funding the development of the game lodge as well as the training of local villagers to become responsible for the running of the lodge. The lodge will benefit from local spend from contractors and other service providers to the mine that will be housed close to the mine in a pleasant natural environment, rather than in the town that is located 40 km away from the mine.

Transparency: The calculations of the losses and gains in the offset process have been written up in a comprehensive report by consulting ecologist Dr Stalmans. The report has been made available to the BBOP Secretariat.

7. Gaps in current offset planning & implementation process and proposed next steps

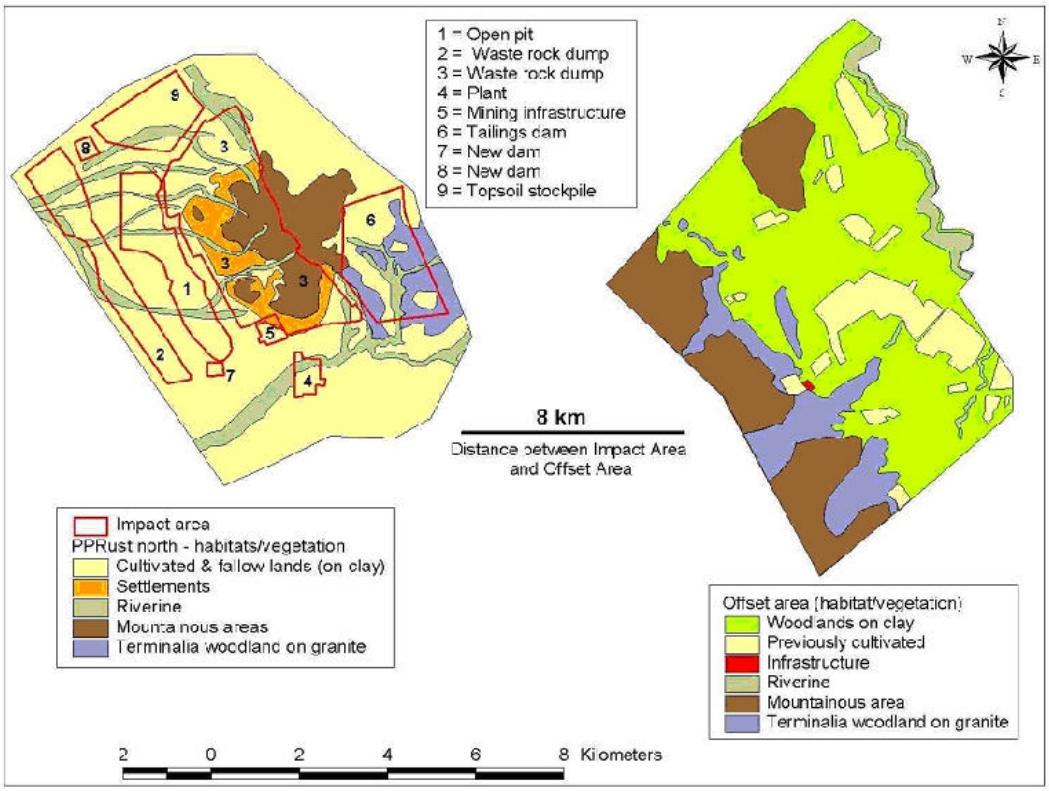
Aspect	Detail	Plans to address current gaps
Company (internal)	First time for an offset process. Although company has staff with conservation management experience it is hard to accommodate the time requirements within the very busy schedule of the SHE department.	Compile a management plan for the offset that clearly sets out requirements and allocates responsibilities.
Offset management and development	No formal plan yet to realize planned biodiversity gains.	Compile a management and development plan (see above). Develop standards, monitoring & assessment procedures so as to measure effectiveness of protection and

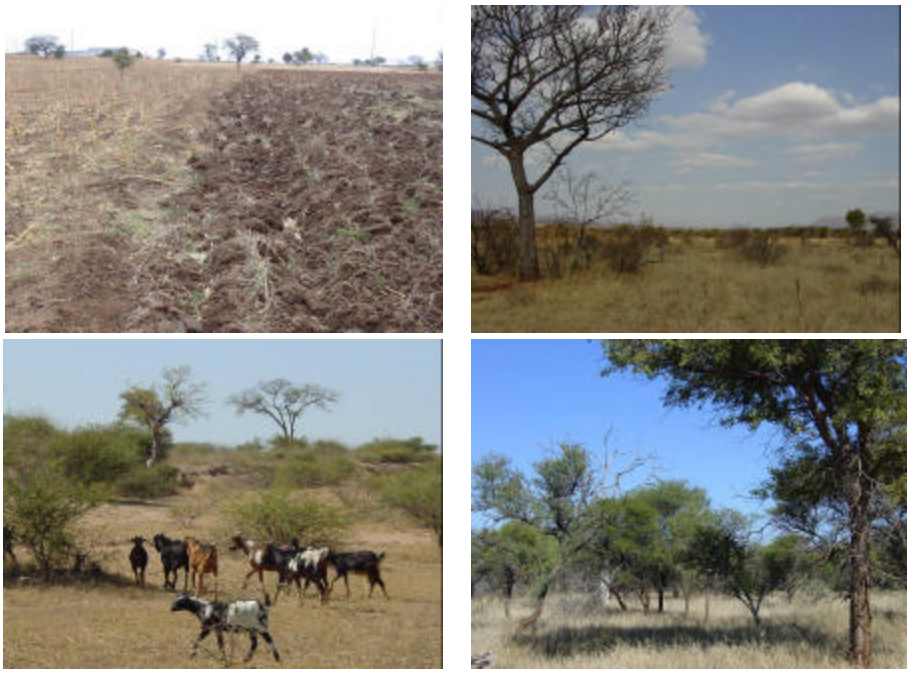
		management and as to whether expected biodiversity gains are being realized.
Stakeholders (external) Financial sustainability	Communities have no prior experience in integrated natural resource management, nor are they familiar with running a game farm and game lodge. No formal dialogue yet with Provincial conservation au thorities with regard to supporting Witvinger Nature Reserve (offset shortfall in Mountain habitat) No long term mechanism in place yet to ensure continued funding of protection and management efforts.	Training and capacity building. Identifying right people. Set up formal liaison and decision-making channels with affected community. Engage Provincial conservation authorities Mine management together with community committee to decide on suitable mechanism. Mine will continue to fund the project for foreseeable future.
Institutional sustainability	No mechanism in place yet for a formal management structure.	Mine management together with community committee to decide on suitable mechanism. Sustainability will be the main re quirement.

8. Way forward

In the coming months, Anglo plans to finalise the design of the offset, discuss its implementation with the stakeholders and make progress with t he management plan for the game lodge.

9. Map & photographs





Left: impact area top – cultivated land
bottom - overgrazed, eroded *Acacia* woodland

Right: offset area top - previously cultivated area
bottom - *Acacia* woodland in good condition.

Ambatovy	**THE AMBATOVY NICKEL PROJECT, MADAGASCAR**

BUSINESS & BIODIVERSITY OFFSETS PROGRAMME
PILOT PROJECT FACT SHEET, MARCH 2008

1. Project summary

Project Setting	Joint Venture mining project including Sherritt International Corporation, Sumitomo Corporation, Kores, and SNC Lavalin Incorporate.
Project Location	The Ambatovy Project is located in the eastern domain of the Republic of Madagascar. It includes a mine site near Moramanga in the Alaotra-Mangoro Region and a large processing plant in Toamasina, Atsinanana Region.
Project Activity	Ambatovy is a large-tonnage nickel project with an annual design capacity of 60,000 tons of nickel, 5,600 tonnes of cobalt and 190,000 tons of ammonium sulphate. Production is scheduled to begin in 2010, with full capacity expected to be achieved by 2012. The project's assessed reserve life is 27 years, with potential for more.
Impact Area	The project's principal impacts will occur at the mine site, through the progressive clearing of the mine footprint (approximately 2100 hectares), located within an ecologically sensitive natural forest mosaic of the eastern mid-altitudinal forest corridor. Stringent impact avoidance and minimization strategies were applied in the design phase of the project, so residual impacts on biodiversity from the other key project components, much of which lie in heavily degraded areas, are of less significance, but will nonetheless be offset. These include pipelines, a processing plant, tailings and dock extension: Approximately 250 km of buried slurry and water pipelines will involve the clearing of secondary, non-sensitive vegetation, then rehabilitation with native vegetation. 98% runs through secondary vegetation resulting from historical slash and burn with comparatively little biodiversity value, but two sections of the pipeline cross sensitive habitats: the first three kilometres of zonal, near-primary forest and the crossing of the Ankenina Zahamena Corridor, where the pipeline curves around residual primary forest fragments. The processing plant is being constructed on an area of 1.5 km^2 of the Toamasina industrial zone. The tailings system of 14km^2 will be located in a highly degraded fire-driven agricultural matrix. An existing dock at the harbour will be extended by 300 meters to accommodate the unloading of equipment during the building phase and the importation of material during operation.. The processing plant, tailings and dock extension are anticipated to have only negligible residual impacts on biodiversity. As the Project has evolved, specific aspects covered in the Environmental and Social Impact Assessment (ESIA) are currently being revisited to ensure that no residual impacts to biodiversity have been neglected. Any further residual impacts identified will be included in the biodiversity offset calculation.
Offset Area	The biodiversity offset for the mine site is still being designed, but current plans anticipate an on-site component and an off-site component. The former would consist of the establishment of 4,900 hectares of buffer forest around the footprint. The latter is located 71 km to the northeast of the mine site and would involve conservation of 11,600 hectares of endangered forest, including a multiple use area of 7,000 hectares and a core conservation area of 4,600 hectares, within which there is a large tract of azonal forest. The impact of the first pipeline section will be included in the offset calculation for the mine site. The second section of pipeline will be offset by reforestation not only of the pipeline footprint, but of broader areas, with the aim of reconnecting the forest corridor.
Offset Activities	The activities being planned for the offset are likely to include protection of threatened forest habitats and species, terrestrial and aquatic; reforestation with native species of targeted areas affected by slash and burn agriculture and where forest connectivity can be enhanced; and local community environmental education and capacity building.
Start of Offset Project	2004.

2. Rationale for the offset

The Ambatovy Project is committed '…to cause no net harm to biological diversity where we operate, to mitigate unavoidable impacts, and to practice responsible closure procedures; … assure the conservation of habitats, flora and fauna, using all reasonable actions and technologies; …ensure responsible attention to the maintenance and, where possible, enhancement of biodiversity in the best interest of our business, the communities in which we operate, and the world at large.' The heart of the Ambatovy Project's biodiversity strategy is to compensate its residual impacts on biodiversity through an offset Programme. This will achieve measurable conservation outcomes that can reasonably be expected to result in no net loss of biodiversity and strive to attain a net gain.

In addition to the Project's ethical commitment to biodiversity protection, the Project has a strong business motivation for this approach. In order to secure a license to operate in an area of high biodiversity the company needs to merit the trust and support of the regulatory authorities and people of Madagascar. Further, the banks that are providing capital to the Ambatovy Project have subscribed to the Equator Principles, which require biodiversity offsets in some circumstances, and are deeply concerned about maintaining their image.

The Project's Biodiversity Policy first included a statement on biodiversity enhancement in 2004. This reflected the Project's biodiversity offset commitment, which was identified at the onset of the Environmental and Social Impact Assessment (ESIA) in 2004.The offset project was developed during the baseline assessment. Its outline is captured in the ESIA, where the Ambatovy Project commits to biodiversity performance beyond regulatory compliance.

3. Local environment

The mine site is located within an ecologically sensitive natural forest mosaic of the eastern mid-altitudinal forest corridor. It lies in a hilly, forested area on a horst between the first and second escarpment at an altitude of 1100 m. The area is notable for its deep laterite profile resulting from eroded ultramaphic bedrock from an 80 million year old intrusion containing nickel and cobalt. The top layer is characterized by a ferrecrete crust that, together with the particular soil chemistry, brought about an edaphic vegetation type best described as an azonal, schlerophyllus forest thicket.

4. Key Biodiversity Components

Key biodiversity components in the mine area include:

- Priority species, with home ranges overlapping the mine footprint: six lemurs (*Prolemur simus, Propithecus d. diadema, Indri indri, Allocebus trichotis, Daubentonia madagascarensis* and *Eleumur rubriventer*); one bird (*Tyto soumagnei*); eight herpetofauna (including *Mantella aurantiaca, M. crocea, Sanzinia madagascariensis)*; and four plants (*Asteropeia micraster, Leptolaena multiflora, Dalbergia baroni*).
- Three structurally distinct habitat types, i.e., zonal, transitional and azonal forests (the latter including seasonal ponds and upper watershed stream systems) and their fauna and flora communities.
- The landscape-level habitat assemblage with the functional interaction between the zonal, transitional and azonal forests.

5. Predicted impacts

The project's principal impacts will occur at the mine site, through the progressive clearing of the mine footprint (approximately 2100 hectares) located within an ecologically sensitive natural forest mosaic of the eastern mid-altitudinal forest corridor. Approximately 50% of the footprint lies on an azonal forest habitat mosaic, to which the ore body is spatially linked. The operation will involve open pit mining with several pits operating at different points in time and space. The pit system will be in operation for approximately 30 years, with sequential openings and closures. Rehabilitation will be exclusively with native species.

Stringent impact avoidance and minimization strategies were applied in the design phase of the project, so residual impacts on biodiversity from the other key project components, much of which lie in heavily degraded areas, are of comparatively less significance, but will nonetheless be offset. There will also be residual impacts that will be offset from the slurry and water pipelines, although the pipelines have been designed so that primary forest sections crossed will be reforested with native tree species. The processing plant, tailings and port extension will be sited in areas that have already been heavily compromised in terms of biodiversity, so there will be negligible residual impact on biodiversity there. Thus the principal work on the biodiversity offset to date has focused on offsetting the impacts of the mine site.

- **Pipelines:** Approximately 250 km of buried slurry and water pipelines will involve the clearing of secondary, non-sensitive vegetation over the Right of Way (RoW) (ancient slash and burn landscape). 98% of the pipeline runs through an undifferentiated secondary vegetation matrix resulting from historical slash and burn with comparatively little biodiversity value. After construction, the RoW will be rehabilitated with vegetation chosen by the communities. Two sections of the pipeline cross sensitive habitats, including the first three kilometres of zonal, near-primary forest and the crossing of the Ankenina Zahamena Corridor, where the pipeline curves around residual primary forest fragments. The impact of the first pipeline section will be included in the offset calculation for the mine site. The second will be offset through an on-site net gain action. The project has committed to reforest specific sections of the pipeline that were deforested previously by agriculture in order to recreate connectivity. This will include the reforestation of areas greater than the RoW footprint, with the aim of reconnecting the forest corridor. In addition, the disturbance generated to the corridor forest by the pipeline route will be offset through the conservation of the Ankera zonal habitats (see proposed offset, below).

- **Plant site:** The processing plant is being constructed over an area of 1.5 km^2 of the Toamasina industrial zone, with negligible residual impact on biodiversity.

- **Tailings:** The tailings system of 14km^2 is to be located in a highly degraded fire-driven agricultural matrix, with negligible residual impact on biodiversity.

- **Harbour:** An existing dock will be extended by 300 meters to accommodate the unloading of equipment during the building phase. The residual impact on biodiversity is predicted to be negligible.

As the Project has evolved, specific aspects covered in the Environmental and Social Impact Assessment (ESIA) are currently being revisited in order to ensure that no residual impacts to biodiversity have been overlooked. Any further residual impacts identified will be included in the biodiversity offset calculation.

5. Proposed offset

The Project's biodiversity offset is still being designed, but current plans anticipate an offset strategy consisting of a composite offset with on-site and off-site components. The offset is being planned to achieve measurable biodiversity conservation outcomes that should result in no net loss of biodiversity and strive to attain a net gain. The first step of this endeavour will compensate for residual adverse impacts from the forest clearings at the mine, and in subsequent steps the Project aims to design the offset to include all residual impact on biodiversity.

Sequential rehabilitation of the mine site will aim to replace the impacted forest with a type likely to resemble the surrounding mid-altitude humid tropical forest. This will require adequate time and proper management. The proposed biodiversity offset programme at the mine site includes onsite and offsite protection of representative stands of azonal forest, buffer zone forest protection based on natural forest management and creation of spatial linkage to the existing forest corridor (contributing to Madagascar's "Durban vision" of tripling areas under protection) in conjunction with regional partners.

On-site, the first component lies in the mitigation hierarchy prior to the offset. An area of 317 hectares of azonal habitats on the ore body that would otherwise be mined is to be set aside for conservation. In addition, one component of the biodiversity offset is likely to consist of the establishment of 4900 hectares of buffer forest (transitional and zonal habitats) a round the footprint area. The off-site offset, in an area called Ankera, is located 71 km to the northeast of the mine site. It was selected based on

comparable geology to that of the mine site, which results in the presence of similar azonal forest habitats to those affected by the project. The Ankera offset comprises 11600 hectares, consisting of a multiple use area of 7000 hectares and a core conservation area of 4600 hectare, within which a large tract of azonal forest is nested. The planned offset activities will include forest management and conservation, species conservation protection and research, community environmental education and awareness programmes as well as agricultural compensation (yield improvements).

The Ambatovy team is currently exploring with the Malagasy government the possibility of securing legally protected status for the Ankera offset as part of the Malagasy protected areas network (SAPM). The Ankera offset management strategy will be detailed in a plan in 2008. In addition, the Mine Area's Conservation Zones have been integrated as important constituents of the Mine Area's land lease, as critical constituents allowing the Project to implement its forest management programme.

6. Key Questions addressed in the design process for the pilot biodiversity offset project

The following section outlines briefly how the emerging Ambatovy offset is addressing some of the key questions associated with biodiversity offset design and implementation, as identified by BBOP.

No Net Loss: The Ambatovy offset programme aims to achieve measurable conservation outcomes that can reasonably be expected to result in no net loss of biodiversity and strive to attain a net gain, by:

- Implementing the 'no species extinction' commitment and ensuring the long term viability of priority species populations impacted by the Project.
- Conserving a viable track of azonal forest habitat through the on-site offset.
- Implementing an off-site offset that contains a core conservation area design to compensate for residual adverse impacts on biodiversity.

Mitigation Hierarchy: The Ambatovy Project's setting (high regional biodiversity and endemicity) underlines the necessity for very stringent biodiversity management in order to comply with the Project's strict Biodiversity policy of 'no net harm to biodiversity'. Prior to consideration of biodiversity offsets, the Ambatovy Project is implementing appropriate avoidance and minimization measures according to the mitigation hierarchy, for instance, by:

- Reducing surface areas to be impacted and avoiding sensitive areas whenever possible at all phases of the Project, including design and implementation, in particular by rerouting the pipeline around ecologically sensitive areas.
- Setting aside an area of the ore body for on-site conservation.
- Mitigating impacts through the implementation of a stringent biodiversity salvaging and management programme.

Key components: Key biodiversity components in the mine area have been identified through extensive baselines studies. They are summarized in section 3, above.

Amount: The planners of the Ambatovy project are using the draft BBOP methodologies to assess the Project's impact on biodiversity, to identify appropriate activities and sites for the biodiversity offset, and to determine the scale of the offset needed to achieve the conservation gains that will achieve no net loss. This approach combines consideration of biodiversity of equivalent or higher value and site selection to ensure all key biodiversity components are represented at the offset, with an approach to determine the necessary scale for the offset that goes beyond simple area-based metrics. Part of this methodology is a tool known as the 'benchmark', which uses the habitat hectares approach described in the draft Biodiversity Offset Design Handbook and developed in Victoria, Australia. At Ambatovy, biodiversity loss was initially calculated using the habitat hectares approach. Early calculations were based on forest structure attributes of the azonal forest habitat. The Project is currently integrating species attributes data to refine the habitat hectares loss score. 786 habitat hectares of azonal habitat will be lost at year 0 (without post-project rehabilitation), but only 472 hectares after 15 to 30 years of mitigation (rehabilitation). The Project also plans to calculate the habitat hectares score for the transitional and zonal habitats. The habitat hectares gain score for the offset sites has yet to be calculated, as detailed forest structure and species attribute quantitative data need to be obtained for the Ankera offset. This will take place as soon as the stakeholder involvement process is completed. As the Ankera site is considered 'in-kind' with the Ambatovy azonal habitats, the same benchmark will be used to calculate gains.

Options: The azonal forest is intrinsically linked to the ultramafic geology and its resulting laterite soils and ferricrete substrate. Approximately 30 potential candidate sites were identified within the mine site biogeographical region based on their geology; candidate site refinement was subsequently carried out by air surveys based on forest cover integrity (many sites having been impacted by forest clearing). The Ankera site was selected based on its high level pristine-ness, which was confirmed by a groundtruthing rapid preliminary multi taxa survey. Importantly, the area had previously and independently been identified by the Missouri Botanical Garden Madagascar (a Project partner) as a potential conservation area for its floral assemblages. A detailed baseline study will be conducted in 2008 to check the offset site for the presence and suitability for all the key biodiversity components identified at the impact site and to support the gain score calculations. The plan is for the Ankera offset to include a core conservation area, surrounded by a multiple use area to ensure social integration of the offset Project and thus its sustainability with local communities.

Stakeholders: The Project has made significant progress in engaging stakeholders, including local communities, to integrate the Ambatovy Project offset programme into national, regional and local plans. At the Ankera offset site, a zoning project aiming at forest community transfer, as contemplated by Malagasy law, is being implemented. A basic zoning into a core conservation area and a sustainable multiple use area has been identified by the community and awaits validation by the Project and Forest Services.

Sustainability: Did the developer design financial and institutional arrangements for the offset to secure its long-term success?

The offset for the Ambatovy Project at Ankera is still being designed, but the plans are to underpin its long term success during the implementation phase by supporting the following three drivers:

1. Strong community involvement throughout the planning, design and implementation phases with accompanying sustainable development activities in the multiple use area of the forest buffer zone.
2. Firm financial company commitments with on-going analysis of what is needed for the sustainable financing mechanism.
3. Sturdy protection of forest real estate, since the proposed offset site lies within the areas planned to be included in the Malagasy protected area system (SAPM), through the Malagasy Presidential Durban commitment. To succeed, implementation of the SAPM vision will require significant outside funding, so that a biodiversity offset of this kind could offer conservation additionality.

Transparency: The Project's biodiversity management activities are being scrutinized by the Malagasy environmental authorities as well as the banks that are providing capital to the project and who adhere to the Equator Principles. The biodiversity offset commitment was proposed at an early stage of the Project in the Environmental and Social Impact Assessment and has undergone a thorough public consultation, hearings and a public information process prior to becoming a BBOP pilot project. It is the Project's commitment to design and implement this biodiversity offset in full compliance with the transparency principle proposed by BBOP.

7. Next steps

In the coming months, the Ambatovy team will continue to plan the on-site and off-site activities for the biodiversity offset, ensure that no residual impacts to biodiversity have been neglected, and explore the most appropriate financial and institutional arrangements for the long-term implementation of the offset.

	BAINBRIDGE ISLAND, USA
BUSINESS & BIODIVERSITY OFFSETS PROGRAMME PILOT PROJECT FACT SHEET, MARCH 2008	

Note: This pilot project is different in kind from most of the other BBOP pilot projects, in that the main collaboration is with local government, which is working on policy development and is in the early stages of establishing local pilot projects.

Lead Entity	City of Bainbridge Island Planning Department
Operation	Policy development and establishment of a portfolio of pilot projects
Location	Bainbridge Island, Washington State, US
Project activity	• Develop policy strategy to incorporate biodiversity offsets into terrestrial and coastal developments. • Demonstrate terrestrial, coastal and urban biodiversity offsets through a portfolio of local pilot projects. Two pilot projects have been selected to date to test and demonstrate biodiversity offset design for terrestrial and intertidal offsets in the context of U.S. environmental policy. This Fact Sheet will focus on one of the pilot projects: the Blakely Harbour project. The other, a small residential development in the most developed, urban area of the City, is still in the early stages of development
Impact area	• Policy: The City of Bainbridge is exploring biodiversity offsets on the island, an area of 73 square kilometres. • Pilot projects: The City is reviewing future development projects to establish which ones may be suitable as biodiversity offset pilot projects. The current pilot projects will involve approximately 12 hectares of direct impact on second growth forest, forested wetland and highly disturbed urban meadow.
Offset area	Yet to be determined. The island supports 73% forest cover but the coastal ecosystem has been very severely impacted by past developments. Priority offset areas are likely to lie in the intertidal and coastal habitats as well as in the degraded areas of the forest and may be consolidated into a habitat bank. In addition, one element of biodiversity offsets could include improving and creating biodiversity-friendly green space in the urban area of the Island.
Offset activities	Offsets for the current pilot projects are likely to include relocation of a shoreline road, removal of rock bulkheads and restoration of intertidal habitat. Upland offsets will likely involve restoration of forested areas through removal of invasive species, replanting of appropriate native conifers and preservation in perpetuity of potentially developable property, either through conservation easements or transfer of development rights.
Partners	The pilot project property owners; the City of Bainbridge Island Planning and Engineering departments, the Bainbridge Island Forestry Commission, the Bainbridge Island Land Trust, and Washington SeaGrant.
Start of project	2005

Background on biodiversity offsets on Bainbridge Island

Bainbridge Island is an urban community measuring approximately 73 square kilometres, just west of the Seattle metropolitan area in Washington State. This island community supports many areas of high biodiversity, including both terrestrial and intertidal habitats. Rapid growth and residential development is severely impacting biodiversity on the island by reducing forest cover, altering intertidal habitats, fragmenting wildlife corridors and allowing invasive species to compromise native vegetation. The city

government on Bainbridge Island is working with the Business and Biodiversity Offsets Programme to incorporate biodiversity offsets into the overall growth strategy for the community to preserve biodiversity while accommodating expected development.

Policy Development

Biodiversity offsets are not required by any local, state or federal regulations, with the exception of offsets in the form of wetland mitigation. Therefore, in order to encourage development projects to incorporate biodiversity offsets for other habitat types (e.g., native forests, shoreline habitat) in their design process, the City of Bainbridge Island is exploring a variety of policy incentives:

- **Expedited permit processing timelines:** Unpredictable and lengthy permit review times are costly to property owners. Expedited review of development permits is likely to secure a commitment from developers to implement offsets. This is an incentive that is widely used in other jurisdictions.
- **Density bonuses:** Density bonuses allow more development units to be authorized within a given area than would otherwise have been contemplated. Density bonuses are most appropriate within higher density or urbanized areas and can encourage development to concentrate in urban areas, reducing further impacts on greenfield sites.
- **Flexible infrastructure and zoning requirements:** Many of the developers that are willing to consider biodiversity offsets are also considering innovative design elements, such as low impact storm water design, sustainable development patterns and green building techniques. Existing policy needs to be modified to allow flexibility in design that would benefit biodiversity.

Next steps for the City biodiversity team on policy development will be to:

- work with local stakeholders and citizens to codify incentive policies and incorporate these into local development regulations;
- clarify the biodiversity offset process for developers submitting planning applications; and
- provide tools specific to the local regulatory environment that allow smaller development or infrastructure projects to incorporate biodiversity offsets into their projects.

Blakely Harbour Pilot Project

The Blakely Harbour pilot project is a cooperative effort between the land owner and the City of Bainbridge Island. The land owner is in the process of developing a portion of the upland forest on the pilot site. Offsets are proposed to compensate for impacts resulting from clearing and construction for the residential development. The landowner will donate right of way on this property so that the City can relocate an adjacent public shoreline road away from the shoreline. The City will restore approximately 600 linear meters of intertidal habitat along the roadway to a more natural condition.

1 Rationale for Offset

For the landowner, collaborating with the City on the biodiversity offset would facilitate smooth progress with the project development and help secure the long term quality of the local environment (to the benefit and enjoyment of those who will live in the property development). For the City, the offset would result in more varied and higher priority conservation than the developer would otherwise undertake. Restoration of the inter-tidal zone is of high priority throughout the Puget Sound and this project is an opportunity to demonstrate offsets in the context of near-shore restoration.

2 Local Environment

Blakely Harbour was once the site of the world's largest lumber mill. In contrast to its intense industrial past, Blakely Harbour is now one of the least developed harbours in Central Puget Sound. The harbour contains a properly functioning pocket estuary within approximately 5 miles of a natal Chinook watershed and provides significant foraging and refugia habitat for juvenile chinook as well as other salmonids and

fishes. Blakely Harbour is the focus of other restoration efforts as part of Washington State's Shared Salmon Strategy to improve habitat quality in the Puget Sound.

The upland project area is located in the Puget Sound Area of the Tsuga heterophylla (Western hemlock) zone, which typically consists of coniferous forest dominated by Douglas fir, western hemlock and western red cedar. The project site contains four forested, palustrine wetlands, two streams and supports a diversity of birds, herptiles and small to medium sized mammals. The upland forests surrounding the harbour provide one of the largest remaining tracts of forest canopy in the area and support habitat and water quality functions that are directly connected with the coastal habitat. The shoreline portion of the property includes approximately 600 linear meters of highly impacted intertidal habitat compromised by a public roadway and associated rock bulkhead.

3 Key Biodiversity Components

The following are the biodiversity components of particular conservation significance in and around Blakely Harbour, defined by vulnerability and irreplaceability criteria.

Biodiversity	Intrinsic Values	Use and Cultural Values
Bird Species Common Loon, Northern goshawk, Pileated woodpecker Bald eagle, Purple martin Horned and Western Grebes Great blue heron, Green-backed heron, Red-tailed hawk Band-tailed pigeon, Common goldeneye, Bufflehead Hooded merganser, Harlequin duck **Herptile Species** Tailed frog **Mammal Species** Long-eared and long-legged myotis, Harbour seal, California sea lion, Orca whale **Fish Species** Chinook salmon, Chum salmon Forage fish	State listed sensitive, candidate and monitor species. Threatened or endangered species: Puget Sound Chinook salmon (T), Bald Eagle(T), Southern Resident Orca Whale Pods (E).	Local fisheries and native peoples use the adjacent Puget Sound year-round as fishing grounds. The bald eagle is the national bird of the United States of America. The orca whale is symbolic of the Puget Sound Region.
Habitats • Nearshore, intertidal • Mixed hardwood forest • Palustrine wetlands	• Most vulnerable • Somewhat threatened • Least threatened	The nearshore or intertidal habitat is currently the focus of many restoration efforts in the Puget Sound region, including the Governor's Shared Salmon Strategy, which Bainbridge Island participates in.
Ecosystem Services • Nearshore, intertidal: habitat for forage fish and juvenile salmonids • Forested uplands: habitat for birds, herptiles and mammals, stormwater attenuation and water quality functions, carbon sequestration • Wetlands: habitat for birds, herptiles and mammals, water quality functions.	These ecosystem services function together to support an interconnected forested to intertidal system.	Large tracts of intact forest near the shoreline are highly valued for their aesthetic value and in contributing to the sense of place on Bainbridge Island.

4 Predicted Impacts

Predicted impacts include private residential development construction in the forested uplands, including clearing, additional impervious surface, as well as noise and water quality impacts related to ongoing residential use. In addition, the City's project to relocate the road will impact forested uplands as well as portions of a palustrine, forested wetland.

5 Proposed Offset

Impacts to the upland forested areas resulting from the residential construction will be offset by restoration of degraded forested habitat elsewhere on the project site and will include removal of invasive English ivy, planting of mid-successional conifer species and potential implementation of a conservation easement. In addition, the property owners will voluntarily dedicate land for public right-of-way to allow the adjacent shoreline road to be moved inland. Pending approval from state and federal agencies, an offset may involve removing the rock bulkhead along the shoreline road and restoring the adjacent intertidal habitat.

6 Key Questions Addressed in the Offset Design Process

No net loss: No net loss of biodiversity is addressed in the offset options by calculating the amount of biodiversity lost through the residential construction and offsetting that loss by restoring degraded portions of the forest throughout the project site. Impacts to water quality resulting from forest clearing and wetland fill for the road relocation project can result in impacts to habitat quality in the intertidal and nearshore region directly adjacent to the project site. To supplement the restoration of forested habitat on the project site, additional 'out of kind' offsets in the intertidal zone may contribute toward the reverse of intertidal habitat degradation resulting from upland impacts. This project will attempt to show the link between upland and intertidal functions to justify the proposed offsets.

Mitigation hierarchy: The mitigation hierarchy was considered in designing the project and considering appropriate offset measures. Impacts to wetlands, streams and steep slopes were avoided wherever possible in the layout for the residential component of the project. A large percentage of the property that would be potentially developable was set aside as open space. At the locations where the access road must cross wetland buffers, the road width was narrowed to minimize impacts. Unavoidable impacts to the forest habitat will be offset as described previously.

Key Components: This project will result in impacts to upland forest and palustrine wetlands. See the Key Biodiversity Components Matrix in paragraph 3 above. Offset options include forest restoration and intertidal habitat restoration. Since out of kind offsets are under consideration, it will be important to identify the specific biodiversity components, including habitat types and ecosystem functions, that will be affected by each aspect of the project so that the overall offset scheme can adequately address and deliver conservation gains for these key components.

Calculating Offset Amount: A combination of techniques, including a method similar to the Habitat Hectare approach used in Australia, as well as the Washington State Wetland Functional Analysis, is being used to establish the amount of biodiversity that will be lost as a result of the residential development and the infrastructure project. This will complement other aspects of the biodiversity offset calculation, such as consideration of key biodiversity components and site selection. An approach for determining an appropriate ratio for amount and type of out-of-kind offsets will need to be developed to measure no net loss of biodiversity throughout the project site.

Stakeholders: The relevant stakeholders for this project include the pilot project property owners, adjacent property owners along Blakely Harbour and users of the shoreline road, local citizens, the City of Bainbridge Island Planning and Engineering departments, the Bainbridge Island Forestry Commission, the local land trust, Washington Sea Grant, and regulatory jurisdictions, including the Washington State Department of Ecology and the US Army Corps of Engineers. Support and cooperation from all of these stakeholders will be essential to the success of this project.

Sustainability: Methods for ensuring the long-term sustainability of the offsets are still under discussion. Existing legal frameworks for conserving and monitoring land in perpetuity include conservation

easements and public dedication of land. A combination of these options will likely be used, depending on the land owners' preference. The project is working closely with the Bainbridge Island Land Trust to facilitate sustainable maintenance of the proposed offsets.

Transparency: Since this is a local government project, all aspects of the project, except those confidential to the property owners, will be available for public review. Methods used to measure biodiversity impacts and to create offsets will be reviewed by a team of local and BBOP scientists and all results and conclusions will be available for public review and comment.

7 Next Steps in Pilot Project Development

The Bainbridge pilot project team has completed the terrestrial forest baseline assessment and is in the process of developing a method for quantifying nearshore habitat impacts and offsets. The team is working with the city engineering department and the upland property owners to design the offsets and consider options for long-term maintenance and protection of the offset areas. The City of Bainbridge Island is also in the process of developing a policy framework to create incentives encouraging the use of biodiversity offsets. It is anticipated that the tools developed for the Blakely Pilot Project will serve as a model for future development on the island to implement biodiversity offsets.

SOLID ENERGY Coals of New Zealand	**STRONGMAN PROJECT, NEW ZEALAND**
BUSINESS & BIODIVERSITY OFFSET S PROGRAMME PILOT PROJECT FACT SHEET, MARCH 2008	

Note: This pilot project is the most recent addition to the BBOP portfolio, and is still in the early stages of developing its biodiversity offset. It is also the first BBOP pilot to seek to offset residual impacts that have already taken place, retrospectively offsetting the residual impacts of a mine project that has already closed.

1. Project summary

Company	Solid Energy New Zealand Ltd
Operation	Strongman II Coal Mine
Location	Greymouth, West Coast of South Island, New Zealand
Project activity	This open cast and underground coal mine supplied 0.5MT per annum to the international metallurgical coal market. It is now closed.
Impact area	Approximately 60 hectares, including road access and off site impacts.
Offset area	Yet to be determined, but to include orphan mine sites, adjoining riparian ecosystems and public amenity areas.
Offset activities	Yet to be determined in consultation with stakeholders, but anticipated to be a combination of habitat enhancement and protection in the adjoining ecosystems through pest and predator control.
Partners (design phase)	Department of Conservation (observers), Mitchell Partnerships (consulting ecologists), Landcare Research (consulting ecologists), Ngati Waewae (tangata whenua / regional Maori Group),
Partners (implementation)	M Bygate Contractors and others
Start of offset project	March 2008

1. Rationale for offset

SENZ's corporate environmental policy requires that the result of all work undertaken is a net positive outcome for the New Zealand environment. All future mining operations, as well as changes to existing operations, are subject to public scrutiny and the associated permits and consents are contestable in the public forum. Demonstrable good stewardship of the impacts of existing and past projects will enhance future business opportunities. Another business driver is that there is increasing interest in the specialist coal market in products with a record of good environmental stewardship.

The Strongman Mine closed in 2005 and has been subject to rehabilitation of the disturbed footprint. The rehabilitation of the site will address several key areas; however, it is unlikely the work will meet the company policy of delivering a net positive environmental gain. Consequently,
Solid Energy NZ is committed to undertaking offsetting activities to address the deficit in terms of environmental impact. This work has started, and the remaining steps of offset design will be concluded during 2008.

2. Local environment

The impact area is situated in the Nelson Coast Temperate Forests in the south west of the Paparoa Range bounding the west coast of the South Island of New Zealand. The terrain is mostly steep and mountainous with surface elevations of up to approximately 650 meters above sea level. A prominent east-west ridge (TK Ridge) forms a watershed between the Ten Mile Creek and Seven Mile Creek catchments. The ranges are characterized by high rainfall (<3000mm) with temperature ranges between -3ºC and 25ºC. The mine site is at approximately 650m above sea level and the area is dominated by coal measure geology deeply incised by two principal catchments (Nine Mile and Ten Mile creeks). These deliver high quality water into catchments. The site is covered with mixed beech and podocarp forest grading to pink and yellow pine dominated sub-alpine vegetation on the upper slopes. Pre mining land-use was limited to recreational hunting and some recreational walking.

The nearest communities are the Rapahoe and Runanga townships, with a combined population of approximately 1000 people. These are satellite, dormitory townships for the Grey District, which has a population of circa 20,000.

The mature indigenous forest is used locally for recreation where access permits. The land is held as a State Coal Reserve but adjoins Conservation estate. Current and potential threats to the landscape include coal mining (which causes habitat destruction); the impacts of pest (particularly possum) browsing on canopy vegetation; and fire from spontaneous combustion in closed mining operations.

3. Key Biodiversity Components

The key biodiversity components of particular conservation significance in and around the impact site are to be defined as the first stage in the design and implementation of the biodiversity offset. The work has yet to be completed, but the following paragraphs offer a basic description of the area's biodiversity.

Vegetation Significance: The vegetation of the study area is similar to that of other coal measures areas along the Paparoa Range and in the Ngakawau Ecological District. A number of different vegetation associations have been recognized in the area, including Silver Beech Rimu Forest, Silver Beech Forest, Rimu-Mountain Beech Forest, Mountain-Beech-Podocarp-Rata Forest, Manuka-Mountain Beech-Podocarp Shrubland, Manuka Shrubland and open vegetation in areas of rock outcrop along ridges and bluffs and talus/scree slopes. The wide range of species present reflects the variety of soil and rock types and habitats.

Birds: Twenty species of birds were recorded in October 1997 during a survey of the Upper Seven Mile area, located approximately 1.5 kilometres to the east of the mine site. Native species recorded in good numbers throughout the survey area were bellbird, tomtit, brown creeper, silvereye, grey warbler and rifleman. Species present in lower numbers were weka, kakariki, great spotted kiwi and morepork while tui, fernbird and fantail were seen only occasionally. Kaka and pigeons were not observed but probably use the tall forest on a seasonal basis. The most significant species is great spotted kiwi, which only occur in the north west of the South Island. The kiwis heard in the Upper Seven Mile area probably represent the southern most limit of the Paparoa Range population.

Bats: Bat species were recorded at only one of 80 sites. The signals were characteristic of long tailed bats.

Reptiles: No reptiles have been recorded but it is possible that the West Coast green gecko occurs in the Bishop Creek forests.

Snails: Shells of the species Powelliphanta rossiana gageii were found in low subalpine shrubland on the ridge between Trigs TK and Y to the south of Bishop Creek. This species appears confined to the Upper Seven Mile area although there are unconfirmed reports of the snail being found at Rewanui. This species of snail is of national interest.

Overall, the area is not included in the Significant Natural Areas register but does form a backdrop to the overall landscape as viewed from the Coastal Highway.

4. Predicted impacts

The predicted residual impacts following the application of the mitigation hierarchy are to be determined once the baseline and benchmark sites have been established. The project comprises an underground and a surface coal mining operation. The mine footprint, including the associated infrastructure traverses altitudes from 150 m to 650 m within two catchments that drain west from the Paparoa Ranges to the Tasman Sea.

Underground mining started in the Strongman 1 Mine in 1939 and continued up until 1994 when Strongman 2 underground mine started production. In 1997, an open cast operation was started to recover the balance of the shallower resource unable to be extracted by underground operations. Strongman 2 underground mine closed in 2004 and open cast mining was completed in early 2005. The site has since been the subject of significant rehabilitation work with land form development and replanting having been undertaken progressively over the past four years. Of the mine infrastructure that was developed over the term of the mining project the access road, the Bathhouse, cable shop, Strongman 1 underground mine portal and the open cast mine contractors workshop are all that remains.

5. Proposed offset

The nature and exact location of the offset activities are still being defined with stakeholders, but the current plans involve already established programmes involving the rehabilitation of an orphan mine site approximately 4kms to the south of the impacted site, the enhancement of riparian values in conjunction with an educational programme being run in the Junior Schools in the nearest communities an the establishment of an amenity resource around existing walking tracks in the area. It is anticipated that a predator and pest control programme, designed to complement the existing programmes being run by the Department of Conservation and the Animal Health Board (statutory authorities responsible for possum control) will form a significant part of the offset activity.

6. Key Questions addressed in the offset process for the pilot project

This work is to be undertaken once the benchmark and impacts have been assessed.

7. Next steps

It is anticipated that the initial benchmark work will be complete by July 2008 with the impact assessment and offset design to be completed by 31 December 2008. Once the key biodiversity components affected by the Strongman project have been identified, it will be important to establish the amount of overall biodiversity that was lost through the Project, and thus the amount of biodiversity (in terms of level of gain, the area and scale of the offset) needed to achieve no net loss. The team plans to use the 'benchmark' approach: an accounting tool from the Draft BBOP Offset Design Handbook. This is a modified version of the habitat hectares approach (developed in Australia). The current focus of work is on identifying suitable expertise to undertake the benchmark and impact assessments. Additional stakeholders representing New Zealand-based NGOs will be approached to join the project.

[1] In April 2002, the Parties to the Convention on Biological Diversity (CBD) committed 'to achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on Earth'. This target was endorsed by the World Summit on Sustainable Development and the United Nations General Assembly and incorporated as a new target under the Millennium Development Goals. (See http://www.cbd.int/2010-target/.) Similarly, in 2001, EU Heads of State committed 'to protect and restore habitats and natural systems and halt the loss of biodiversity by 2010'.
(See http://ue.eu.int/ueDocs/cms_Data/docs/pressData/en/ec/00200-r1.en1.pdf.)

[2] 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. ISBN: 2-8317-0854-0
http://www.insightinvestment.com/Documents/responsibility/Reports/Biodiversity_Offsets_Report.pdf

[3] The BBOP Advisory Committee currently comprises representatives from: Anglo American; Birdlife International; the Cambridge Centre for Conservation Policy; the City of Bainbridge Island; Conservation International; the Department of Conservation, New Zealand; the Department of Sustainability & Environment, Victoria, Australia; Ecoagriculture Partners; Environment Australia; Fauna and Flora International; Forest Trends; the International Institute of Environment and Development; Insight Investment; the International Finance Corporation; IUCN (International Union for Conservation of Nature); KfW Bankengruppe; Newmont Mining Corporation; Shell; the Sierra Gorda Biosphere Reserve, Mexico; the Southern Rift Landowners Association, Kenya; Rio Tinto; the Biodiversity Neutral Initiative; the Centre for Research-Information-Action for Development in Africa; the London Zoological Society; the Ministry of Ecology and Sustainable Development, France; the Ministry of Housing, Spatial Planning & the Environment, Netherlands; the National Ecology Institute, Mexico; the National Environmental Management Authority, Uganda; The Nature Conservancy; the Royal Botanic Gardens, Kew; Sherritt International Corporation; the South African National Biodiversity Institute; Solid Energy New Zealand; the Tulalip Tribes; the United Nations Development Program (Footprint Neutral Initiative); the US Agency for International Development; the US Fish and Wildlife Service; Wageningen University, Netherlands; the Wildlife Conservation Society; and WWF.