

Rio Tinto and biodiversity
Biodiversity offset design

Rio Tinto

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This booklet has been developed to provide an understanding of Rio Tinto's developing approach to biodiversity offsetting, in the context of its biodiversity strategy and "net positive impact" (NPI) goal. This document is not intended to be a "how to guide" on biodiversity offset design and implementation.

Rio Tinto and NPI

The use of offsets to compensate for biodiversity loss is being practised widely and is increasingly required by legislation in a number of countries where we operate. Rio Tinto believes the development of an integrated package of offsets, as well as "additional conservation actions",¹ can help us meet our goal of having a net positive impact on biodiversity.

How does Rio Tinto define a biodiversity offset?

Offsets are conservation actions designed to compensate for the unavoidable residual impacts on biodiversity caused by mining and processing. Offsets should never be employed in the place of appropriate on-site mitigation measures, but rather seek to address only the remaining residual gap.²

An offset action takes place away from the impact site and normally takes the form of either averted disturbance or ecological restoration. Averted disturbance involves reducing existing external impacts such as land clearing by other forest users, lessees or owners. Ecological restoration may take place from scratch, where bare substrate is planted and restored, or may involve changing management practices of existing, partially degraded or non-pristine habitat to restore biodiversity status and values. Clearly, some offsets will involve aspects of both averted disturbance and ecological restoration.

¹ "Additional conservation actions" include a broad range of activities which are intended to benefit biodiversity, but whose effects, or outcomes can be difficult to quantify. For example: helping to build capacity in conservation organisations to enable better biodiversity conservation outcomes on projects they are involved with. This might include supporting their participation in environmental management and development programmes.

² Adapted from ten Kate K, Bishop J, Bayon R (2004). Biodiversity offsets: views, experience and the business case. Insight Investment and IUCN.

How are we developing biodiversity offsets?

Since 2004 Rio Tinto has been testing offset methodologies internally through a set of pilot projects at a number of our operations, including Rio Tinto Madagascar and Corumbá in Brazil. In addition we have been involved in external biodiversity offset initiatives such as the Business and Biodiversity Offset Programme.

Through our pilots we are learning that while the nature of an offset will vary from situation to situation, the basic design and implementation steps remain constant. Currently we are breaking down offset design into seven key steps.

- 1)** The key biodiversity features and their values at the site are determined and prioritised (details on the values assessment can be found in Rio Tinto and biodiversity – Achieving results on the ground) and a risk assessment carried out to understand the potential magnitude and likelihood of impacts upon these values.
- 2)** The total residual impact is calculated by measuring the area and quality, or condition of habitat, of biodiversity value likely to be lost after the mitigation hierarchy has been followed.³

- 3)** Possible offset sites are screened for their potential by assessing their biodiversity assets (eg what species and habitats are there) and the potential to conserve or improve them.

- 4)** Each possible offset site is then assessed in practical terms such as land cost and tenure, local community requirements and the political implications of the different offsets. This socio-political-economic screening is extremely important and appropriate stakeholder consultation is required.

- 5)** The conservation interventions required to conserve biodiversity are designed in a participatory fashion with relevant stakeholders – such as prevention of habitat loss or eradication of invasive species. In most cases, the initial thinking on this has already taken place, but the scope, duration, resource requirements and all other details are determined at this stage, and usually pulled together in a written proposal.

- 6)** The offset site and management plan is confirmed and communicated, and negotiated with the relevant regulators and other stakeholders.

- 7)** Once any necessary permits are granted, the implementation phase begins.

³ Rio Tinto is exploring a number of methods to assess biodiversity loss and gain. These include methods developed in-house, those developed previously by external agencies and those in development by the Business and Biodiversity Offset Programme.

Expected outcome

Whenever we embark on an offset project, we endeavour to design and implement a project that will compensate for the residual impact on biodiversity once actions to mitigate the impact have been put in place. If an operation can demonstrate it has sufficiently compensated for the negative impacts on biodiversity through mitigation, then an offset may not be required. Depending upon the situation, the compensation of residual impact may be achieved through a single project or, as is the case with a number of our pilot projects, through the implementation of an integrated offset package made up of a number of complementary projects (see the Rio Tinto Madagascar example on page 6). The offset must be sustainable through a life span agreed to by key stakeholders, though in perpetuity is the preference in order to appropriately claim the offset.

While we recognise the importance of “like-for-like”⁴ offsets from a conservation regulatory and accounting point of view, we believe that in certain situations they may be unrealistic, inappropriate or do not result in optimal outcomes. As the concept of offsets continues to evolve, it is becoming recognised that “out-of-kind”⁵ offsets may result in greater conservation benefits – such as offsetting common habitat with an area of national

conservation priority. Conversely we recognise that “worse-for-like” offsets (where the biodiversity value of the offset site is lower than the impact site’s) does not compensate for the residual impact of our operations.

Additional conservation actions (ACAs)

Rio Tinto does not consider capacity building and environmental education programmes as offsets but as ACAs. This is because the biodiversity gains of such activities (on species and habitats) are difficult to quantify and balance against the residual biodiversity losses. ACAs still form an important part of demonstrating our positive contribution to biodiversity conservation as outlined in the principles of our biodiversity strategy (see *Rio Tinto and biodiversity – Achieving results on the ground*).

Many operations are already undertaking a number of ACAs, which have multiple benefits to the operation. Benefits include building relationships and improving the capacities and livelihoods of local stakeholders including communities, NGOs and government.

⁴ “Like-for-like” means the habitat type with biodiversity value in the offset is the same as that impacted – such as a forest Type A for a forest Type A or a wetland Type B for a wetland Type B.

⁵ “Out-of-kind” means offsets that conserve habitats that are different from those affected by the project and have equivalent or higher conservation value.

Who develops and manages an offset?

Planning, establishing and managing offsets can be a significant challenge for an operation. Here are three ways an offset may be managed, with potential for all three approaches to be taken during the life of an offset.

1) The offset could be developed and managed (to various degrees) in a partnership arrangement with one or more public or civil agencies, such as a local landholder group, local conservation organisation and/or similar environmental body. This may be preferable when the mining operation does not have the capacity to manage the offset and where additional benefits can be gained through the partnering process.

2) An offset could be entirely owned and managed by the operation if that is most appropriate.

3) The offset could be outsourced entirely, either through handing over an existing offset to an external agency, or through purchasing a new offset from a recognised public or private offset provider. Conservation banks such as the New South Wales Biobanking Scheme in Australia, or the US Wetlands Mitigation programmes in North America are examples.

Creating and maintaining land parcels or other offset programmes using the first two options is a significant undertaking and involves a number of different activities, including the arrangement of sustainable financing, negotiating with landowners, building capacity and in some cases, building the capacity of partnering institutions. Designing and implementing offset sustainability mechanisms (legal, financial, social) is probably the largest challenge in offset implementation.

When is an offset not appropriate?

There are a number of situations where we believe that biodiversity offsets are an inappropriate management tool for Rio Tinto operations.

- 1) Where the operational impact is on completely irreplaceable biodiversity values.
- 2) Where the offset is not likely to be viable or sustainable, eg where the background rates of biodiversity loss are so great that the integrity of the offset is unacceptably threatened.

Moving forward

While we believe that we have made significant progress around defining, planning and implementing biodiversity offsets, we realise there is considerably more work to do on this important aspect of biodiversity management. Offsets are a critical tool in our biodiversity strategy – without offsets, we will not be able to achieve our NPI goal. We are therefore committed to continue our work in collaboration with others, including our biodiversity partners, to explore and develop offset methodologies. We will also continue to engage externally through initiatives such as the Business and Biodiversity Offset Programme.

Case study

Designing and implementing an offset programme in Madagascar

Rio Tinto's subsidiary QIT Madagascar Minerals (QMM) has developed a biodiversity offset strategy and implementation plan over the past few years, and at the same time has put in place several offset projects.

The number and scale of impacts potentially caused by this project over the 60 year mine life are such that a composite offset, involving several sites, has been designed in order to reach NPI. The experience for this site has been that while offset design is not always a linear process as mapped out in this booklet, all steps are required for a credible offset to be designed.

The QMM project involves three ilmenite deposits which will be mined over the next 60 years, road infrastructure and a new deepwater port.

The mining lease harbours significant tracts of littoral forest, a rare habitat in Madagascar, which contains a number of threatened and locally endemic species. In addition, a number of local communities live within or near the lease and their livelihoods are based on the natural resources, such as the forests and the fisheries of the region.

QMM has engaged with biodiversity stakeholders for more than 15 years, particularly on issues of species and habitat conservation (intrinsic values), and biodiversity-based livelihoods of local communities (service values). In practice, the definition of key biodiversity values has been an iterative process which has been refined over the years and was brought together by the biodiversity action planning process.

Identifying biodiversity values

- Service values: Offsets have been designed to compensate for the opportunity costs local communities will experience as a result of mining activities. These include tree plantations and reed cultivation plots. The extensive plantations (currently 1,000 hectares) of fast growing trees are being grown both off-site and in post-mining rehabilitation areas and will provide a local source of charcoal (household energy) and timber for both the affected communities and the growing regional population as a whole.
 - Intrinsic values: QMM has invested in a very large team of environmental and biodiversity specialists in order to fully understand the biodiversity within and around the lease, in particular the littoral forest habitat and the threatened or locally endemic species it contains. This work has resulted in the identification of a large number of biodiversity values at both the species and habitat levels, making these littoral forests some of the best known ecosystems in Madagascar.
- A local reed which will be impacted by mining is called *Mahampy Lepironia mucronata* and is of great importance for women's livelihoods. The reed has now been experimentally grown in plots. The per hectare biomass harvest from these plots is higher than natural Mahampy swamp areas that will be impacted by the mining operation.

Identifying residual impacts

A clear understanding of these biodiversity values has been essential to understand the requirements of the offset sites. Twelve potential offset sites were considered using the biodiversity values identified in the assessment. Eight of these were discarded due to social, legal and political constraints. For example, some were already protected areas, others were heavily relied upon by local communities, and yet others were too far away to effect reliable management intervention. The four sites chosen are given in *Table 01* opposite, together with their main biodiversity components and the method of intervention.

With the potential offsets sites identified, work is now underway to establish and consolidate the management structures and conservation actions that will support the conservation gains at each of these sites. In some case, such as Tsitongambarika, this process will take a number of years to complete. In all cases the success of these projects will be reliant upon Rio Tinto's close collaboration with a number of local and international organisations and individuals.

Table 01: Principal offset sites for intrinsic values impacted by the QMM project

Biodiversity components	Management intervention	Projected net impact in terms of forest area and quality at mine closure (+60 years)
Mandena, Petriky and St Luce ilmenite deposits		
Littoral forest, swamp forest, constituent threatened and locally endemic species.	Avoidance and rehabilitation programmes.	Loss of: -1217 quality hectares
Tsitongambarika		75,000ha
Humid forest, littoral forest tree species, littoral forest mammal and reptile species, and many other locally endemic, threatened and new to science species. In addition, important catchment protection and carbon sequestration/storage services.	Avoided deforestation through: 1. Designation as a national protected area. 2. Community based ecological monitoring direct payments projects.	Gain of: +5760 quality hectares (note this is humid forest)
Mahabo		1,5500ha
Littoral forest and constituent priority species such as <i>Croton louvelii</i> and <i>Leptolaena pauciflora</i> , two priority plants also found in QMM forests.	Avoided deforestation through: 1. Designation as a national protected area. 2. Avoided deforestation and promoted reforestation through community based sustainable resource use projects.	Gain of: +211 quality hectares
St Luce forests		470ha
Littoral forest and constituent priority species – particularly those locally endemic to the St Luce ilmenite deposit.	Avoided deforestation and degradation through community based sustainable resource use projects. A reforestation programme is also planned.	Gain of: +171 quality hectares
Ambatotsirongoro		135ha
Transitional littoral forest. Some key species such as <i>Phelsuma antanosy</i> , a rare gecko.	Avoided deforestation plus a reforestation programme, managed through community based sustainable resource use projects.	Gain of: +169.5 quality hectares
Total quality hectares of forest		+5095 quality hectares⁶

⁶ Note some of these are humid forest so this calculation includes both "like-for-like" and "out-of-kind" offsets.

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Rio Tinto and biodiversity – Group biodiversity profile

Case studies:

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- *The Conservation International – Rio Tinto Partnership*
- *The Earthwatch Institute – Rio Tinto Partnership*
- *Fauna & Flora International – Rio Tinto Partnership*
- *Royal Botanic Gardens, Kew – Rio Tinto Partnership*
- *Protecting biodiversity at Great Salt Lake – On the ground at Kennecott Utah Copper*
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Designed by Flag

Printed in England by Cousin

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