



BIODIVERSITY OFFSETS: LESSONS LEARNT FROM POLICY AND PRACTICE

COUNTRY SUMMARY REPORT: SOUTH AFRICA

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September 2015

**BUSINESS & BIODIVERSITY PROGRAMME
FAUNA & FLORA INTERNATIONAL**

Supported by the Arcus Foundation

1 INTRODUCTION

Over recent years, the uptake of biodiversity offsets as a mechanism for addressing the residual impacts of project development has increased rapidly. Whilst comprehensive guidance for biodiversity offsets has been developed¹, it is widely recognised that offset implementation faces a host of technical, social and governance challenges. In guiding the future development and implementation of offsets to achieve biodiversity conservation it is important to learn from offset experience around the world. South Africa has been working towards developing a national offset policy for at least the last six years and has considerable practical experience in the development of offset guidelines and the development and implementation of offset plans and projects. The assessment of biodiversity offsetting in South Africa was conducted through interviews and the review of publicly available documentation. This report summarises the findings of the assessment and covers the development and implementation of national and provincial offsetting frameworks and guidelines, and lessons learned for moving forward.

2 THE SOUTH AFRICAN CONTEXT

2.1 Ecological and economic context

South Africa has over 95,000 known species, making it the third most biologically diverse country in the world, and includes three of the 34 global biodiversity hotspots. At the same time, as one of the 'BRICS', South Africa is recognised as one of the five most important emerging global economies, with a national development plan aiming to double GDP and eliminate poverty by 2030. Some of this economic development has caused severe reductions in natural habitat. Interest is therefore high in the potential for biodiversity offsetting, applied as the last step in the mitigation hierarchy, to mitigate residual environmental impacts that will arise in pursuing developmental targets.

2.2 National legislative frameworks relevant for offsetting

At present there is no national legislation in South Africa mandating biodiversity offsetting. Offsets have been the subject of frequent policy discussion, with a draft national policy produced in 2012 and a further discussion document on 'environmental offsets' produced by the Department of Environmental Affairs (DEA) in 2015, with the latter attempting to bundle multiple 'offsets' topics (including biodiversity, water resources, air quality and carbon) into one discussion. This has raised concern among some experts given the particular challenges associated with biodiversity offsets. As of August 2015, there is no indication that either a centralised environmental offsetting policy or a biodiversity offset policy is close to being ratified, although a March 2016 deadline for the latter has been set by the national environmental department. Nevertheless, there are a number of national laws, policies and plans that frame the conditions for biodiversity offsetting and thus offsets can be stipulated as conditions of environmental authorisation for development projects on a case-by-case basis by the relevant authorities.

¹ Such as that developed by the Business and Biodiversity Offsets Programme, BBOP.

The first of these is the National Environment Management Act (NEMA) (Act 107 of 1998) that underlies all environmental impact assessment (EIA) and management in South Africa. This states that disturbance of ecosystems and loss of biological diversity should be avoided or, where it cannot be altogether avoided, minimised and remedied. The practicality of invoking an offset requirement relies on the EIA process as prescribed by the NEMA EIA regulations². Based on provincial guidelines for biodiversity offsets in South Africa, the EIA must establish the significance of residual impacts, and these are then used to trigger an offset as a remediating mechanism. Importantly, the competent authority can require evidence of well-planned offsets within the EIA before it is accepted and those offset plans can then be mandated as conditions within the approval to develop. Efforts to streamline and expedite the environmental authorisation process through introduction of the 'One Environmental System' (OES)³ could make it more difficult to achieve in practice.

The aim of the OES is to improve the ease of doing business and to further enhance South Africa's global competitiveness as a mining investment jurisdiction. Under the OES, the Minister of Mineral Resources will issue environmental authorisations and waste management licences in terms of the NEMA, and the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), respectively, for mining and related activities. The Minister of Environmental Affairs will be the appeal authority for these authorisations.

The NEMA states that those responsible for harming the environment are responsible for remedying pollution and environmental degradation. This is generally known as the 'polluter pays' principle and is the piece of legislation that is understood by regulators to permit them to require an offset for damage to be made by the proponent, without the need for additional, offset-specific legislation. Regulations promulgated in 2014 under NEMA further state that⁴ 'A holder [of a mining permit] must determine and make financial provision for the rehabilitation and management of negative environmental impacts from prospecting, exploration, mining or production operations to the satisfaction of the Minister responsible for mineral resources.'

The NEMA was followed by the 2003 Protected Areas Act (PAA), which allowed non-State lands to become protected areas and by the 2004 Biodiversity Act, which allowed for the listing of threatened and protected ecosystems as well as the categorisation of activities within such areas as 'threatening', all of which facilitated the implementation of offsets. These pieces of legislation were complemented by existing and new taxation legislation that support tax breaks for certain environmental conservation activities, and by the 1998 Water Act, which imposes a duty of care on landowners to ensure water sources are not polluted.

Key non-legislative frameworks include the DEA's Biodiversity Stewardship South Africa Programme (BSSA), which covers the concept of using non-state actors to fulfil state objectives to conserve biodiversity, and the South African National Biodiversity Institute (SANBI)'s regularly updated National Biodiversity Assessment (NBA), last completed in 2011. The NBA is a scientifically robust assessment of the relative threat and protection status of all ecosystem types across the country, which makes it a valuable resource for identifying trends in biodiversity status, potential optimum offset locations and 'no-go areas' for development.

² The EIA regulations fall under, and from, NEMA. New regulations were promulgated in terms of Chapter 5 of NEMA and were published on 4 December 2014 in Government Regulation Gazette No. R 10328. Listing notices (GN R982-R985) list activities that are subject to an environmental assessment.

³ Rollout of the OES commenced in December 2014.

⁴ National Environmental Management Act, 1998 (Act No. 107 of 1998) Regulations pertaining to the financial provision for the rehabilitation, closure and post closure of prospecting, exploration, mining or production operations. October 2014.

2.3 Provincial frameworks and guidelines for offsets

In the absence of an overarching national offsets policy framework, two of South Africa's nine provinces (Western Cape and KwaZulu-Natal) have developed their own offsetting schemes and guidelines, based on the national legal frameworks that do exist, on data from the NBAs and on additional fine-scale provincial biodiversity assessments and plans. A third provincial environmental department (Gauteng) has developed draft guidelines internally, but they have not been made public to date. In the South African context, biodiversity offsets aim for 'no net loss (NNL) in relation to conservation targets' whereby scientifically determined conservation targets are the basis for calculating offset requirements (through protecting biodiversity and adding this to the conservation network), rather than an 'absolute NNL goal' (e.g. assessed relative to the impacts and in the context of an appropriate counterfactual scenario). A characteristic common to all provincial efforts is that NNL through restoration actions is not deemed feasible. Averted loss offsets⁵ therefore form the basis of provincial offsets systems focusing on the conservation of critical biodiversity areas, meeting biodiversity targets, preventing ecosystems dropping below 'endangered' status and arresting the decline of species and 'special habitats'. This is partly because of the pressure for economic development in what is still a country with systemic poverty and partly because ecologists view many habitats in South Africa as impossible to restore. Very often, these 'averted loss' offsets would be regarded as achieving NNL relative to the background rate of loss. However, this is not explicitly measured in the SA system.

The provinces with the most publicly accessible biodiversity offset guidelines are the Western Cape (WC) and KwaZulu-Natal (KZN). The WC is one of South Africa's most biodiverse provinces, particularly in terms of flora, most of which lies outside protected areas. WC was also the first province, in 2005, to introduce any offsetting guidelines (revised in 2007), with KZN following suit a couple of years later. In both provinces offsets are required to mitigate impacts on biodiversity of 'medium' to 'high' significance, with impacts of 'very high' significance being considered 'no-go'. Given the inconsistency in evaluating the significance of impacts on biodiversity in practice, both provinces have introduced protocols for assessing significance based around four criteria. These cover i) pattern considerations, covering the threat status of species, ecosystems and special habitats, ii) process considerations, covering watercourses, habitat corridors etc., iii) ecosystem service considerations and iv) composite considerations reflected in systematic biodiversity plans, covering interactions between pattern, process and services. A notable facet of the WC guidelines is that they require the use of IUCN Red Data lists in addition to the 2004 National Biodiversity Act's Threatened and Protected Species regulations, since the latter does not take into account species threatened by habitat transformation or invasive species.

In both provinces the need for offsets should be identified during the EIA process following the mitigation hierarchy in accordance with the NEMA, when a proposed activity triggers an EIA requirement. The listed activities cover numerous types of activity in most development sectors. In theory the offsets are meant to be secured before development, although in practice this rarely seems to happen. The intention is for offsets to ensure the protection of priority areas for conservation in perpetuity, either through like-for-like sites or trading up. In addition, offsets must provide sufficient funds for managing and rehabilitating (where relevant) offset sites for a pre-determined time period. In both WC and KZN the size of offset is based on ratios (conservation-

⁵ Averted loss offsets: Biodiversity gains achieved by averting the loss and/or degradation of biodiversity by removing or reducing threats to habitats and species. For averted loss offsets to be defensible, it must be shown that ongoing or impending threats are imminent and will have significant positive impacts on biodiversity. Averted loss offsets must result in measurable conservation outcomes.

based multipliers) that are related to the remaining extent, and conservation and protection status, of affected biodiversity. Ecosystems or vegetation types are used as the main surrogate for biodiversity overall. The size of offset can also be adjusted according to habitat condition, presence of threatened species or habitats, the ecological process value of the habitat and the effect on ecosystem services. Livelihoods programmes would be considered where their target was reduction in pressure on specific areas and/or species. Research or training is rarely considered appropriate as the principal focus of an offset plan in either province, and investment in existing protected areas is unlikely to be approved. Biobanking schemes are deemed to have potential but are yet to be established.

2.4 National guidelines for wetland offsets

In 2014, the provincial offsetting guidelines were supplemented by the first national offset guidelines, specifically for wetlands, produced by SANBI⁶, which is intended to apply nationally, rather than to a particular province. The wetland offsets guidelines are primarily aimed at the water use authorisation process, either as part of an application for a Water Use Licence under the National Water Act or as part of an EIA under the NEMA.

The goal of wetland offsetting is to “achieve no net loss and preferably a net gain on the ground with respect to water resources (focusing on the importance of wetlands for supporting water resource management objectives, as well as people’s use and cultural values associated with wetlands), ecosystem and habitat objectives (especially in terms of meeting national and local objectives for habitat protection and avoiding worsening of ecosystem threat status), and species of special concern (particular threatened, rare or keystone wetland species)”. This reflects the fact that wetlands are among the small number of ecosystems in South Africa for which restoration – under specific conditions - is considered a feasible option and hence appropriately designed and implemented offsets might be able to achieve NNL or net gain through restoration interventions. The guidelines provide details of how to achieve NNL with regard to impacts on aquatic systems and include how to calculate the residual impact of a development on water resources, ecosystems and species and specify the methodology to be applied when determining the type and scale of offset required. Like the provincial plans, they are triggered by the identification of ‘medium’ to ‘high’ significance impacts on wetland ecosystems.

The guidelines allow for five types of offset activity, which can be implemented in combination: legal protection of previously unprotected areas, activities that avert losses to an existing wetland, rehabilitation, establishment of a new wetland or direct compensation to affected parties. However, determination of the size of an appropriate offset is markedly more complex for wetlands than for terrestrial ecosystems, with calculations based on Hydro-Geomorphic Units and a range of multipliers based on the impacts on water resources and ecosystem services, impacts on ecosystem conservation (including protection and threat status, regional context, local site attributes such as connectivity) and impacts on specific species.

⁶ Macfarlane, D., Holness, S.D., von Hase, A., Brownlie, S. & Dini, J. (2014) Wetland offsets: a best-practice guideline for South Africa. South African National Biodiversity Institute and the Department of Water Affairs

3 LESSONS LEARNT IN OFFSETTING POLICY AND PRACTICE

3.1 Politics and Policy

Consequences of not having an overarching national offset policy for sub-national offsetting schemes

The lack of an overarching national offset policy tends to result in the development of inconsistent approaches to offsetting at local levels, without a set of common rules. However, whilst a national guiding framework is important, it is equally vital to retain enough flexibility to allow the details of offset planning and implementation to be tailored to local contexts. In South Africa, attempts to introduce a national biodiversity offsetting policy framework have been ongoing for at least the past six years. In the meantime, a number of South Africa's provincial governments have developed their own policy frameworks, practical methodologies and guidance documents regarding when and how offsetting is to be implemented in their jurisdictions. This has meant that policy has tended to be informed by practice both within and outside of South Africa (such as that published by the Business and Biodiversity Offsets Programme, BBOP), and the process has resulted in the development of methods and policies that are informed by international and local experience and tailored to local ecological, social and political realities.

However, the absence of an offsetting policy at national level has resulted in a number of ad hoc positions regarding offsets. For example, the Department of Energy is now requiring offsets from renewable energy developers (such as solar and wind farms) but without following any kind of standard practice. Many experts regard their approach as 'just ticking boxes'. The finalisation and full implementation of robust offset regulations is also being stalled, even in provinces with their own methods and guidelines, because many local departments are waiting for national level policy to guide how they go about it and/or to ensure that their approaches are consistent with the national policy.

The national policy vacuum has also provided scope for protracted debate in relation to appropriate offset ratios and baselines. It is further retarding progress and confidence in the use of offsets, while simultaneously permitting a questionable spectrum of frequently unenforceable 'offset conditions' to be linked to proposed developments. In the absence of national policy, developers may also 'hedge' that the application of offsetting requirements will weaken in the future, encouraging them to plan offsets to secure licences, and then to delay spending money on implementation. Given the absence of explicit offset policy or regulation, conditions of approvals requiring offsets may therefore be vulnerable to legal challenge.

A national policy on offsets would introduce some predictability to offset requirements and thus is likely to generate more predictable demand for offset sites, in turn possibly catalysing interest in biobanking options. Moreover, it could potentially open up funding mechanisms through the creation of appropriate financial structures, which are currently a major challenge in terms of the practical implementation of offsets in South Africa.

Politics as a significant barrier to achieving conservation benefits from offsetting

Politics can be a significant and frequent barrier to achieving conservation benefits from offsetting. Offset sites that are identified as first choice from a biodiversity perspective must also be deemed politically feasible. If a proposed offset site is on land where a government anticipates major development potential in future (e.g. mining, housing developments, etc.), the offset plan may well not be approved by regulating authorities, regardless of the potential biodiversity benefits. The result can be an offset plan that is a compromise (i.e. targeting lower

priority areas), and therefore not the best possible option from a conservation perspective. In South Africa, the case for biodiversity conservation has been strengthened through the development of biodiversity sector plans and fine-scale systematic conservation plans that highlight priority areas for protecting biodiversity, based on explicit conservation targets. This has helped to underpin integrated land use planning and decision making that takes biodiversity and ecological processes into account. There will inevitably be trade-offs and politics remains highly influential in this regard, yet there is an excellent foundation on the basis of which trade-offs can be evaluated. Clear guidance will be needed to support appropriate and consistent use and interpretation of landscape plans, and limits must be defined and applied.

Political pressure on governments to support development – to drive economic growth, job creation and so on – can further weaken the case for robust application of the mitigation hierarchy and offsetting practices. In South Africa, ecologists and offsetting experts cite many examples where a development project should not have been approved as proposed because of impacts on irreplaceable biodiversity, yet approval appeared to have been the only politically palatable option. At the Koeberg Nuclear Power plant in South Africa, for example, there is pressure to remove offset obligations that protect a nearby nature reserve (which contains nationally important habitat types), to allow the plant to expand on to that land. In countries where sub-surface land rights take precedence, the long-term sustainability of offset sites is particularly vulnerable to changing political contexts and the future prioritisation of resource exploitation over and above other land uses, including conservation.

Offsets can be used as a political negotiation tactic by planning authorities, with the result that the offset requirement attached to a licence is not necessarily the best outcome for biodiversity (or even sufficient to compensate for impacts), but rather the best the authorities could negotiate out of the developer. This is a particular problem where, as in South Africa, there is no overarching offsetting policy or regulations to provide a final word. In Limpopo Province, for example, the controversial Coal of Africa Ltd (CoAL)'s Vele Colliery in the buffer area to the Mapungubwe Cultural Landscape World Heritage Site (WHS) was closed temporarily in 2010 for non-compliance with environmental and water regulations (see Case Study 1 and references therein). After lengthy negotiations the mine was permitted to resume operations under certain conditions including a requirement for a retrospective 'offset'. It is unclear, however, whether the final design of the offset speaks to the impact that it must address, and whether it is sufficient. The Save Mapungubwe Coalition has raised its concern that conditions of the offset agreement are 'vague, inadequate and largely unenforceable'. It is also important to note that in this case, opportunities for avoidance and mitigation have been entirely missed and therefore the 'offset' is not an offset in its truest sense and is rather a form of retrospective compensation. Nonetheless, post-approval 'offset by negotiation' continues to be an issue in some cases in the South African system and has fuelled calls for greater transparency. In this case it is also the perception of some stakeholders that the details of the offset are open to future renegotiation, which casts doubt over long-term outcomes.

Legislative uncertainty risks weakening commitment to robust offsetting practice

Legislative uncertainty can further compromise commitment, on the part of both developer and regulator, to ensuring the rigorous application of the mitigation hierarchy and development of offsets that are appropriate for addressing residual impacts on biodiversity. This is particularly true where there is scope to circumvent obligations and/or to delay action or payment in anticipation of weakening regulations or gaps in compliance monitoring. In South Africa, introduction of the new One Environmental System (OES) in December 2014 has generated legislative uncertainty, with associated law reform having been hampered by problematic legislative drafting, the staggered commencement of different sections of the various pieces of

amendment legislation, and incomplete execution. A notable change under the new OES is that responsibility for the implementation of NEMA as it relates to mining now falls under the Department of Mineral Resources (DMR) rather than the DEA. The DMR is therefore the competent authority responsible for issuing environmental authorisations for mining-related developments. The DEA acts as the appeal authority. Since the OES was introduced, mining companies and the DMR have received criticism for a failure to adhere to environmental law.

For example, in the Western Cape mining company Elandsfontein Exploration and Mining (Pty) Ltd (EEM) is reported to have withdrawn its application to provincial environment authorities for authorisation of NEMA listed activities relating to its proposed phosphate strip mining project shortly before the OES came into effect. The application has been controversial from the outset because of biodiversity, water and heritage concerns. The site lies above two vital aquifers, one of which flows into the Langebaan Lagoon, and the company will be mining inside the upper aquifer unit. The site also borders a national park in a CBA and is the location of a world-renowned fossil site. According to reports, EEM received approval from the DMR under the Mineral and Petroleum Resources Development Act of 2002 for the proposed mining project based on EEM's environmental management programme (EMPr)⁷ report and the company has since commenced clearance of vegetation and construction of roads.

However, concerns have been raised that environmental authorisation for these specific activities has neither been sought nor approved and that activities are therefore going ahead without any mechanism to ensure environmental impacts are mitigated and managed⁸. According to online reports, the DMR has stated that the EMPr remains valid until set aside on appeal or by a court and that EEM can carry on its mining activities until that happens. The EMPr further refers to and strongly recommends the development of a biodiversity offset to mitigate some residual impacts of the development (e.g. relating to the 'unavoidable removal of indigenous vegetation'). However, these impacts have not been quantified in the publicly available report and few details relating to planned offset sites or activities are included. It is therefore difficult to ascertain from the available documentation the specific conditions to which EEM must adhere with regard to mitigation of impacts and offset commitments.

Cases such as this, in which legislative uncertainty linked to the introduction of the OES appears to have weakened the application of environmental law, raise serious questions regarding the extent to which rigorous application of the mitigation hierarchy and development of suitable and appropriate offset plans will be required, monitored and enforced moving forward.

Where no-go areas are not adequately protected and development is approved, compensation for biodiversity loss may be the only remaining option

The delineation of, and adherence to, 'no-go' areas for development where biodiversity is seen to be irreplaceable is critical for biodiversity conservation. Yet even the highest orders of protection are sometimes not enough to secure an area for biodiversity in perpetuity – especially in countries in which sub-surface land rights take precedence. Often sites identified as 'no-go' areas (e.g. in biodiversity plans) have no legal protection as yet and, in the case of large public infrastructure projects and what are seen to be 'strategic' resources for exploitation, development may be approved. In these situations, compensation for biodiversity loss may well be the only

⁷ Braaf (2014) Environmental Management Programme. Ref.No. WC30/5/1/2/2/10043. Report prepared for Elandsfontein Phosphate Mine, West Coast, Western Cape. September 2014: <http://www.braafsa.com/index.php/documents-for-comment/summary/32-mining-right-process-and-updates/215-eia-empr>

⁸ For example: <http://cer.org.za/news/mining-companies-launch-their-first-attacks-on-the-one-environmental-system> and <http://oxpeckers.org/2015/03/west-coast-mine-tests-new-oes-authorisation-system/>

remaining option to mitigate residual negative impacts, after all efforts to avoid and minimise development impacts have been made.

The Shaw's Pass road-widening project in the Western Cape of South Africa is one such example. Whilst experts and conservationists argue that the development should never have gone ahead owing to the affected habitat being rare and largely irreplaceable, the project was required on the grounds of public safety. The provincial roads department was required to offset impacts to a one-hectare area of Critically Endangered habitat, which contained important endemic plant species, at a ratio of 30:1. The offset was secured on private land with the landowner signing an agreement to designate and manage the area as a Nature Reserve (formal protected area in terms of the Protected Areas Act), and the roads department setting aside funds for its management. In this case the offset was permitted under exceptional circumstances, which included the relatively limited size of the impact, and has been deemed a success (see Case Study 2 for further details). However, ordinarily impacts on Critically Endangered habitat in South Africa would not be considered eligible for offsetting.

In situations where the 'no-go' option is unlikely to be upheld and development is approved irrespective of the biodiversity significance of an area, it is imperative that proponents are required to fully apply the mitigation hierarchy, taking all possible measures to avoid, minimise or reduce their environmental impact and, where possible, reversing any damage through ecological restoration, with biodiversity offsets used as a last resort to compensate for any residual impacts.

3.2 Enforcement and institutional frameworks

Barriers to compliance monitoring and/or enforcement must be overcome for offsets to deliver positive outcomes for biodiversity

Inadequate resourcing of government departments and agencies is commonplace in South Africa and raises questions regarding the long-term management, monitoring and enforcement of offsets where responsibility for particular activities sits with government. Additionally, compliance monitoring and enforcement at national level in South Africa predominantly responds to complaints of non-compliance rather than being proactive in investigating compliance. There is thus little chance that offset non-compliance will register within this system. With the number of offsets set to rise, government agencies and regulators are rapidly approaching the point at which they will simply be unable to afford the time to undertake management activities and compliance monitoring, and they lack the resources to employ additional staff. The situation has been exacerbated in South Africa by the fact that it can be difficult for public bodies to receive funds from external sources to cover staff costs, meaning that in many cases the offset budget could not be used to fund offset management and monitoring by government agencies. This has been cited as a significant problem within the South African system, which many say needs to change.

Currently, in the Western Cape, monitoring of offsets to ensure they have been, and continue to be, implemented according to the agreement between the developer and the regulator is in many cases the responsibility of CapeNature (the provincial conservation agency). Yet monitoring the current number of offset sites in the province (let alone the number that might be added in future) presents a major challenge for the agency owing to human and financial resource constraints. This has been compounded by the fact that, in some cases, offset pricing has failed to include the costs of monitoring. Where offset pricing has provided for monitoring costs there have been difficulties associated with injecting money from a private fund into a public body, limiting the extent to which funds are accessible to the monitoring agency.

Ideally, each offset project should be responsible for financing and implementing monitoring and evaluation, including independent auditing, and in turn report to the competent authority, which can then direct available resources to necessary follow-up (i.e. where there are concerns) and enforcement. Various functions, including compliance monitoring, can be fulfilled by service providers (e.g. independent environmental auditors) thereby alleviating the burden on government agencies and regulators. In a number of proposed offsets there have been proposals for an independent mechanism such as a trust fund to be set up and an independent consultant contracted to undertake monitoring and/or environmental auditing. For example, a sand mining project on the coast of KZN has built monitoring costs into its offset budget. It is proposed that independent experts will be contracted to undertake detailed monitoring and submit reports to the local conservation agency, thus relieving the agency of the monitoring burden. Compliance is to be based on offset targets, so the proponent must demonstrate that targets have been met rather than, for example, that a specific area has been rehabilitated. This means that if an area or approach fails, they must try another in order to meet targets. Likewise with a limestone mining project on the WC coast and Gamsberg zinc mine in the Northern Cape, the costs of management, monitoring and independent performance audits have been included in the financial provision to be made by the developer. These activities are to be undertaken by reputable and appropriately qualified professionals.

Whilst service providers can help to deliver a number of functions, some of the activities involved in the set-up and management of offset sites can only be undertaken by the responsible conservation agencies (e.g. investigating and preparing a site for its declaration as a protected area, and the subsequent support for its management that is required in terms of any stewardship programme). The additional burden presented by a growing number of offsets could be severe. The question of how to build in resourcing for offset management and monitoring at start-up and to support sustainability in perpetuity remains to be addressed.

Biodiversity expertise and on-the-ground implementation experience are essential in the development of enforceable licensing conditions.

Biodiversity expertise and pragmatic implementation insight and experience within the authorities that are responsible for approving proposed offset plans is essential in the development of practical, enforceable conditions on licences in relation to offsetting. In South Africa, examples of weak or unenforceable licensing conditions have included those that do not clearly establish which entity is responsible for implementing the offset; vague requirements relating to offset size, essential biodiversity components, location and/or deadlines for implementation; and conditions that allow for the exact timing of future payments for an offset to be dependent on the continued operations of the project, giving companies a financial get-out clause if profits fall.

In recent years, the involvement of independent experts in the process of drafting licensing conditions has contributed to the development of pragmatic and enforceable offsetting requirements in some cases in South Africa. For example, the offset plan for Black Mountain Mining's Gamsberg project in the Northern Cape (see Case Study 3) has been mandated via conditions to the environmental authorisation, which the authorities were assisted in drafting by offset experts. In another case, Afrisam's Saldanha cement project in the WC, the conditions of the environmental authorisation refer explicitly to requirements of the biodiversity offset set out in an expert report to the EIA, prepared by offset specialists. It is hoped that this collaborative process will increase the likelihood that licensing conditions transpire to be realistic and enforceable.

Failings in institutional frameworks lead to poor biodiversity outcomes from offsetting.

There have been cases in which environmental authorisations were issued before the offset agreement (which should have been a condition on the environmental licence) had been finalised and signed, simply because the two processes involved different parts of government, between which there was insufficient communication and coordination. In Cape Town in the WC, provincial government is the decision maker with regard to issuance of environmental licences and offsetting requirements, but often passes responsibility back to the city authorities for working with the developer to determine how to implement them. Lack of communication between the two institutions results in missed opportunities, not least because the question of whether the licensing conditions are realistic, practical and enforceable is addressed only *after* they have already been drafted.

3.3 Financing

A successful national offsetting framework depends on establishment of financing vehicles

Difficulties associated with establishing offsetting finance structures have proved a major cause of delays and failures. A successful national offsetting framework depends crucially on early establishment of financing vehicles that are simple to use, transparent and securely governed.

In South Africa, the trust fund model has, to date, often proved difficult to implement because government agencies are unable or unwilling to hold the trusts themselves. In some cases this may be because money could not be ring-fenced by public bodies (i.e. it might end up in central treasury). Others cite fears that the agency would face budget cuts by central government if it was seen to be 'sitting on a pile of money'. Government bodies are also not permitted to make interest on capital, which they would have to be able to do in order to finance the offset over the long term from the trust fund. Attempts have been made instead to persuade conservation NGOs to hold and administer trust funds, but with limited success, apparently because some NGOs fear the increased audit scrutiny that would accompany this responsibility and a lack of clarity on the limits of the liability.

Nevertheless, examples of the successful negotiation, planning and establishment of financing vehicles are emerging in the South African context. In the case of Gamsberg zinc mine (Case Study 3) the developer has been contracted to provide a prescribed amount of money per year (until mine closure plus 10 years) into a trust, and that contract is enforceable through any court. The developer has also put up surety to protect against a situation in which the mine (operated by a subsidiary of the company) claims no profits and refuses to pay. If land purchases fail then penalties are payable to the government, who then must use that money to buy the required areas of land. Trust funds have also been established for the Shaw's Pass offset (Case Study 2) for which CapeNature⁹ is to hold the trust fund, and the Muizenberg housing development offset for which a levy from the home owners' association goes into a trust fund managed by the Cape Town Environmental Education Trust, which in turn uses the funds to hire a manager for the land.

The Atlantis land bank scheme in Cape Town¹⁰ is another interesting case, which came about because the City of Cape Town had funds available (and ring-fenced) to purchase land around

⁹ CapeNature is a public institution with the statutory responsibility for biodiversity conservation in the Western Cape.

¹⁰ <http://citiesprogramme.com/wp-content/uploads/2015/05/Case-Study-Cape-Town-Sustainability.pdf>

an existing nature reserve. The money remained unused because the land owner in the targeted area refused to sell. An alternative area, 'Atlantis', was identified and 'banked' using the city's available funds. Under this scenario, the City of Cape Town buys an area of threatened ecosystem and 'banks' that land. This 'unlocks' development of an equivalent area (based on the ratios system) without penalising the developer, and without the developer needing to pay for the offset because it will already have been implemented and financed by the city through this land purchase. The intention is to add these 'bank' areas as contiguous blocks onto existing areas that are managed for conservation, to reduce the resources required for management. This is an unusual and probably stand-alone case given the existing funds and their restricted use for land purchase. Were it to be repeated, it would certainly be preferable to require developers to buy credits from the 'bank', rather than using the bank to absolve them of the responsibility to pay for the gains that are offsetting their impacts. Success for biodiversity depends crucially on companies being held responsible for generating sufficient compensatory biodiversity gains, regardless of the costs.

At national level, a biodiversity offset will be required for the construction of a 113-kilometre road through a greenfield area along the Wild Coast by the South African National Roads Agency as a condition of the project's environmental licence. As a national infrastructure project, this is intended to act as a pilot to inform national policy and the DEA about the process for national level offsets and the costs to the Treasury when large-scale public projects are required to offset.

Offset funding linked to company profit should be avoided

Offset funding as a percentage of company profits has been permitted for a number of developments in South Africa and presents serious risks to offset implementation and biodiversity outcomes. An offset costs a certain amount to achieve, such that reducing funding when profits fall can amount to complete failure in terms of the offset's goals, rather than proportionally reduced levels of success. The provision of phased payments has also been applied in some cases and can be problematic from an ecological perspective, particularly where the impact of a project is not phased in a way that justifies phasing offset implementation. For example, the conditions of the environmental authorisation for the Vele coal mine in Limpopo Province allow for the exact timing of future payments for the offset to be dependent on the continued operations of the colliery, effectively giving the company and its subsidiary a financial get-out clause if profits fall¹¹. Phased payments linked to company profit further threaten the longevity and security of the offset, given the company's well-publicised financial problems¹² (see also Case Study 1). This is not an isolated case. An offset required for the development of a residential estate near Malmesbury in the WC had the offset management fund tied to successful, successive phases of the project. The subsequent downturn in the housing market meant that the successive phases did not happen. The eventual shortfall in terms of biodiversity gains compared to losses remains unclear. Phased payments linked to company profits should never be permitted.

3.4 Timelines

Short timelines in the EIA process force premature consideration of offsets

It is crucial that offsets are only considered as an option after avoidance and minimisation have been addressed. However, South Africa's most recent 2014 EIA regulations (NEMA) dictate tight time limits on the EIA process, which are forcing earlier consideration of offsets. This poses a

¹¹ Offsets agreement between a subsidiary of CoAL, Limpopo Coal Company Proprietary Limited (LCC) and SanParks: https://www.environment.gov.za/sites/default/files/docs/biodiversity_offsetagreement.pdf

¹² E.g. <http://www.financialmail.co.za/business/money/2013/07/11/coal-of-africa-funding-model-that-works>

very real risk of 'offsets as a first mitigation option', designing offsets before the formal start of the EIA process (i.e. before avoidance and mitigation measures have been taken and with no authority control or input).

Integration of biodiversity offset design within the EIA process can benefit biodiversity and strengthen stakeholder support

The integration of biodiversity offset design into the EIA process can offer greater potential for impact avoidance through re-design because it makes the benefits of avoidance and minimisation clearer through subsequently reduced offset costs. This tends to make avoidance a more tangibly advantageous strategy to the developer. In South Africa, the competent authority can require evidence of well-planned offsets within the EIA, before it is accepted, and those offset plans can then be mandated as conditions within the approval to develop. Consequently, there are a number of cases in which offset plans have been required by the competent authority either as part of the environmental authorisation process or as a licensing condition.

AfriSam South Africa (Pty) Ltd (AfriSam), for example, submitted a request for environmental authorisation for its proposed construction of a cement plant and associated infrastructure in the Saldanha region of the WC. The proposed project includes the establishment of limestone and clay quarries, and a transport corridor to transfer the raw material from the quarries to the proposed cement plant¹³. Initial application for environmental authorisation was turned down by the environmental authority in light of significant impacts identified in the project EIA for the Saldanha vegetation and flora, including potential loss of irreplaceable biodiversity. Further information as to how the mitigation hierarchy was applied, and an offset feasibility assessment and plan to address residual botanical impacts, was required by the competent authority. Offset experts were commissioned to undertake this work in two phases: the first phase included detailed review and update of available data on the conservation status and distribution of local endemic flora and vegetation, and discussion with selected stakeholders to determine whether or not the affected biodiversity would be irreplaceable (or 'not possible to offset'); the second phase comprised offset design and planning¹⁴. This has allowed for greater rigour to be incorporated into the planning process for the Saldanha Cement Project such that it has effectively had to re-visit and demonstrate *how* the mitigation hierarchy (and in particular avoidance and minimisation measures) has been applied to date. In addition, the offset study 'raised the bar' in terms of improving the rigour of baseline studies and ensuring that residual botanical impacts were quantified, as well as investigating the feasibility of developing suitable and appropriate offsets to compensate for those impacts. It reflects a real strength in the South African system that offset plans can and *are* being required and integrated as part of the EIA process.

Where EIA and offset planning processes have overlapped it has been possible for experts to demonstrate the business case, through proper application of the mitigation hierarchy, for avoiding the need for an offset altogether or reducing the offset requirement through avoidance and minimisation of impacts. It has also provided longer timelines for the development of the offset plan allowing for development of an improved plan. For Black Mountain Mining (BMM)'s Gamsberg zinc mine project in the Northern Cape (Case Study 3) temporal overlap between the process of offset planning and the project's EIA was recommended by the provincial conservation authority due to the area's biodiversity importance. This enabled the proponent and experts involved to optimise application of the mitigation hierarchy, ensure that interdependencies between different biodiversity and water studies could be identified through

¹³ <http://www.aurecongroup.com/en/public-participation/search-results.aspx?keywords=afrisam>

¹⁴ http://www.forest-trends.org/documents/files/doc_4586.pdf

the EIA process, maximising avoidance and minimising impacts (and thereby reducing residual impacts) through mine re-design prior to calculating offset requirements¹⁵. Importantly, it was stipulated in conditions of the environmental authorisation that BMM was not permitted to commence any activities until a legal agreement had been signed with the provincial conservation authority. Suitable offset sites were subsequently identified. Alignment of offset planning and the EIA processes and engagement with key conservation stakeholders further improved stakeholder support for the outcome. The result was an agreement between the mining company and the provincial conservation regulatory authority to implement and manage a biodiversity offset⁵ (see also Case Study 2).

The time it takes to implement an offset should not be underestimated – and too often is.

The design and implementation of an offset can take a long time and this is often underestimated. Long timelines are caused by a number of factors, including:

- There are many separate steps in taking an offset plan to implementation including those required to establish appropriate financing mechanisms, secure an offset site, establish appropriate management strategies and implement and monitor these, with potential for delays at every stage.
- Securing land tenure or land management agreements with landowners and agreeing and setting up trust funds or other financing structures can involve complex and lengthy processes.
- Inefficiencies created through the handling of offsetting requirements by multiple agencies have contributed to delays in South Africa.
- In South Africa it can take several years to secure Nature Reserve status, which is often the aim of conservation organisations where offsets are concerned because it is the lowest level of protection that (in theory) precludes mining.
- The time it takes for offsetting actions to be fully implemented and converted into biodiversity gains. Restoration of habitat can take decades, even centuries, and there is no certainty that full species composition equivalent to the affected native ecosystem will ever be achieved. This is one of the reasons why South Africa has opted for a managed-drawdown approach.

The Shaw's Pass road-widening project has been considered by many to be a success, yet it did take years to be realised largely because of protracted disagreements over where the trust fund (required for staged payments for protection and management of the offset site) should be held and which organisation should be responsible for its management and administration (see Case Study 2). It is unlikely to be easily replicable with the same institutions.

Time delays in biodiversity gains relative to impacts

At the very least, payment that fully finances the offset plan should be required *before* the impact is allowed to occur, with the funds being transferred to an appropriate vehicle before the project is under way. Preferably, offsets should be *implemented* prior to impacts occurring. Without these safeguards, there is a significant risk that the offset will never be realised on the ground, whilst the project goes ahead and the impact occurs. This has occurred in a number of cases in South Africa. For example, the national government department responsible for the Spring Grove Dam development in KZN was required to prepare a 'detailed plan of action to establish offset areas' as a licensing condition, but without any timelines, required outcomes or specifics about

¹⁵ Hughes, J., Ahuja, L., Brownlie, S., Botha, M., Desmet, P. & Heather-Clark, S. (2015) [Using biodiversity plans to guide mitigation and offsets for a zine mine in Northern Cape, South Africa](#). Paper presented at the 35th Annual Conference of the International Association for Impact Assessment. 20-23 April 2015. Florence, Italy.

financial provision. Inundation of the dam basin started in 2013 and although preliminary planning for suitable offsets has been undertaken, there is to date no clarity on when, if ever, offsets will be implemented. In more recent instances, however, the conditions of environmental authorisation stipulate that construction cannot begin until there is assurance that the offset site will be / has been secured, and funds set aside. The timelines in which a proponent must secure the offset site and implement the offset are also increasingly being incorporated into licensing conditions.

3.5 Practicalities of implementation

Capacity building in all sectors is crucial for offsets to work for biodiversity

One of the main challenges cited by practitioners and experts in South Africa is uneven capacity across all competent environmental authorities (including the DMR, given that it is now responsible for environmental authorisations relating to mining sector activities under the new OES), biodiversity specialists and EIA practitioners with regard to understanding and applying biodiversity offsets. This is also true of the NGO sector. To make offsets work, there is a dire need to build capacity and foster continual learning processes across all sectors.

Involvement of independent experts improves quality and feasibility of offsets

The involvement of independent experts has also been demonstrated in South Africa to be crucial for improving the quality and feasibility of offset design. Recent offset planning processes led by experts (e.g. for the Gamsberg project in the Northern Cape) have focused on demonstrating how the mitigation hierarchy should be applied to avoid and minimise impacts on irreplaceable biodiversity, the extent to which offsets are feasible for addressing residual impacts, and how best to achieve offset requirements in the landscape (e.g. Case Study 2 and references therein). Plans have sought to provide a budget estimate and recommended actions for securing that budget. Continuity of expertise is also important. In the case of the Gamsberg project the involvement of offset experts and other environmental consultants ceased after the ESIA had been completed and others were to be appointed to prepare the Environmental Management Plans (EMPs), which means there is little, if any, continuity when taking the ESIA's findings into the EMP.

Good communication, stakeholder consultation and transparency are essential to success

Good communication is essential in the development and implementation of offset policy. Communication and coordination between the agencies involved in the drafting of licensing conditions and those working with the offset developer to ensure their practical implementation; between the developer and land owners; and between the developer and stakeholders in and around an offset site. Ultimately, the Shaw's Pass offset was hailed a success by conservationists. It seems that this was in no small part due to the various stakeholders involved (CapeNature, the land owner, the Department of Environmental Affairs and Development Planning, the provisional Department of Transport, etc.) and their ability to achieve mutual agreement regarding the details of offset implementation and financing. Successful negotiations between CapeNature and the landowner also led to an additional 30-40ha, on top of the 30ha offset, being included within the Nature Reserve, and good potential for a further 100ha of threatened habitat to be managed for conservation by the landowner (see Case Study 2).

In many other offset studies undertaken to date (e.g. Spring Grove Dam, Saldanha Cement Project, N2 Toll Highway, Gamsberg Zinc Mine) engagement with key stakeholders has been critical in informing and influencing the design and location of offsets. The insights of authorities and conservation agencies, as well as farmers' associations and other NGOs and CBOs active in

the affected area are invaluable in arriving at an optimum plan and strategy for implementation of offsets, as well as workable financial and logistical arrangements. In the Spring Grove Dam offset study, where stewardship is seen as the predominant mode of securing and managing suitable offset areas, it was essential to gauge landowner willingness to enter into a form of conservation agreement with the provincial conservation agency; without willing participants, and where expropriation or purchase of land was not seen to be feasible, offsets could not be secured. Experience in South African cases points to transparency in offset studies building trust amongst stakeholders and potentially minimising subsequent legal challenges for the developer.

Mapping of biodiversity and conservation priorities is an important enabling factor

The mapping of biodiversity and identification of conservation priorities at the relevant scale are important enabling factors – both in terms of facilitating offset design and implementation, and in driving impact avoidance for the most critical areas, particularly where combined with mandatory offsetting requirements linked to ecosystem threat status. South Africa's national, spatial ecosystem classification system is an essential foundation for the NBA 2011 and underpins offsetting in South Africa. By categorising the ecosystem threat status, this mapping essentially provides developers with an early warning system of risks to proposed development that would result in further biodiversity loss, and simultaneously highlights priority areas for biodiversity conservation – also known as 'offset receiving areas'. This has been an invaluable enabling factor in terms of delivering offsets that work for biodiversity, not least because the robustness of the science behind the NBA enables challenges by developers to be strongly defended. It has allowed experts to determine which ecosystems are being affected by a development, what the offset ratios should be, and where suitable offset receiving areas are located in the landscape.

The communication of 'offset receiving areas' is, however, thought to be counterproductive, partly because it can have the effect of increasing land prices in areas best suited for offsets. For example, a developer wishing to convert land ranked as critically important for biodiversity in South Africa must secure an offset in the same ecosystem type at an area ratio of 30:1 and show, among other requirements, that its functionality is the same as that of the affected area. In the Northern Cape, three developers have in turn walked away from what is apparently a prime site for wind farm development, because it falls within an area on the spatial biodiversity assessment that is ranked as critical, and the likely resistance from the public and authorities and the costs of offsetting impacts at a large ratio are simply too much for them.

South Africa has further invested in the development of finer-scale biodiversity mapping and biodiversity sector plans that identify priority areas for protecting biodiversity, maintaining ecological infrastructure and achieving national and regional conservation targets based on defensible scientific evidence. These include Critical Biodiversity Areas (CBAs) that best represent a region's natural diversity, including threatened or unusual habitats and ecosystems, flora and fauna, and the underlying ecological functions, and where these should be conserved in the most land-efficient way. Where this level of information exists, it has enabled experts to base all aspects of offset planning and design on meaningful ecological data. This has greatly facilitated, and helped to validate, assessment of: (a) whether offsets are feasible; (b) the quantitative scale of residual impacts; and (c) where best to locate offsets to meet ratio requirements and to achieve conservation goals. Availability of regional spatial data, coupled with engagement of knowledgeable experts, was an essential factor in the development of the Gamsberg mining project and offset plan and allowed for well-informed evaluation of biodiversity impacts in a regional context, and confirmed the potential to achieve biodiversity offsets as the

basis for environmental licensing. Existing fine-scale vegetation mapping further enabled the identification and prioritisation of suitable offset sites¹⁶ (see also Case Study 3).

The Saldanha Bay region in the WC was declared as a new industrial development zone (IDZ) in 2012 and, according to the National Development Plan, the IDZ of Saldanha is strategically positioned to serve the envisaged oil-and-gas sector on the African continent and will create opportunities for components manufacturing to support the oil-and-gas industry¹⁷. The conservation importance of this and the wider area has been well documented, with several restricted distribution vegetation types, threatened ecosystems and flora species of conservation concern. CBAs have further been identified that also form part of key landscape-scale conservation corridors in the WC and play a vital role in allowing ecosystems to adapt to a changing climate. The existence of a biodiversity sector plan and fine-scale systematic conservation plan for Saldanha Bay Municipality¹⁸ and, importantly, explicit conservation targets for the area have been crucial in supporting rigorous application of the mitigation hierarchy so as to mitigate impacts (principally through avoidance and minimisation measures) on irreplaceable biodiversity and assess the feasibility and location of offsets for a number of recent development project proposals (e.g. Afrisam's Saldanha Cement Project), with NNL relative to conservation targets as the goal. Additional fine-scale, specialist botanical studies have provided vital information on which to base proposed mitigation measures and offset planning.

Offset site selection must include consideration of ecosystem function

Ecosystem functions are the range of functions that result from ecosystem processes and benefit life, such as supporting food chains and providing refuge and nursery grounds for species. These functions include the ecosystem services on which human lives, livelihoods and wellbeing depend, such as clean water supply, pollination and spiritual inspiration. Just because an area is the right size and habitat does not mean it will perform the right function in the landscape. Offset site selection must include consideration of functionality.

In South Africa, ecosystem function is incorporated in provincial offset and national wetland offset guidelines. For example, for the quantification of residual impacts and offset requirements, both the WC's and KZN's offsets guidelines propose that the physical size of the offset is determined on the basis of a basic offset ratio applied to a development project's residual impact. The ratio depends on the threat status of the affected ecosystem as determined by the NBA and provincial biodiversity plans and assessments. The size of the offset is then adjusted according to a number of additional criteria, which include the role of the affected area in the wider landscape with regard to ecological processes (e.g. corridor function) and to the delivery of ecosystem services (or the biodiversity underpinning them).

Wetland offsets specifically include (and in many cases may focus on) mitigating residual impacts on ecosystem services, hydrological functioning and water resources (including both water resource and water quality objectives). The quantification of residual impacts and

¹⁶ Hughes, J., Ahuja, L., Brownlie, S., Botha, M., Desmet, P. & Heather-Clark, S. (2015) [Using biodiversity plans to guide mitigation and offsets for a zine mine in Northern Cape, South Africa](#). Paper presented at the 35th Annual Conference of the International Association for Impact Assessment. 20-23 April 2015. Florence, Italy.

¹⁷ Welman, L. and Ferreira, S.L.A., 2014: Regional development of Saldanha Bay region, South Africa: The role of Saldanha Steel. In: Rogerson, C.M. and Szymańska, D. editors, *Bulletin of Geography. Socio-economic Series*, No. 26, Toruń: Nicolaus Copernicus University, pp. 219–231. DOI: <http://dx.doi.org/10.2478/bog-2014-0055>

¹⁸ Maree, K. & Vromans, D. (2010). The Biodiversity Sector Plan for the Saldanha Bay, Bergrivier, Cedarberg and Matzikama Municipalities. Supporting land-use planning and decision-making in Critical Biodiversity Areas and Ecological Support Areas. Produced by CapeNature as part of the C.A.P.E. Fine-scale Biodiversity Planning Project. SANBI, Kirstenbosch. Available from: <http://bgis.sanbi.org/fsp/saldanha/CBA.asp>

calculations of gains from proposed offsets explicitly take into account wetland functionality (i.e. water resources and ecosystem services) as well as ecosystem conservation and species of conservation concern.

In both KZN and the WC the respective guidelines do not prescribe exactly what the adjustments to the offset size would be when the above circumstances apply with regard to ecosystem function and services, relying on a case-by-case assessment and a prescription to involve experts in that assessment. The existence of the updated (2011) NBA and of fine-scale mapping of ecosystems at the provincial level help mitigate risks of developers attempting to reduce the size of the offset requirement by clearly establishing where priority areas occur, and where these might overlap with habitats that appear to be of 'poor' condition but are important for ecological functioning. In other words, areas that appear to be degraded, and which might therefore elicit attempts from developers to reduce their offset ratios, but which play crucial supporting or process roles within their ecosystems, have been identified and mapped, on the basis of defensible science, which greatly supports the ability of agencies and regulators to defend the basic ratios and to reject attempts to apply adjustment factors to reduce them.

It is worth noting, however, that in South Africa neither resource-economic nor social impact assessments are routinely carried out as part of EIAs. It is generally only the larger, complex and/or controversial EIAs that commission them (e.g. an ESIA was conducted by ERM for Black Mountain Mining's Gamsberg project in the Northern Cape). As a result, EIAs seldom explicitly address the linkages and dependencies between biodiversity and ecosystem services and human wellbeing. The economic value of ecosystem services is rarely determined. This makes the ecosystem services consideration, referred to above, particularly challenging to take into account in adjusting the required size of offset.

Offset site selection must consider external threats and the potential to address them

In a number of cases the selection of an offset site has not taken into account wider spatial or development planning, and the effects that third party or external impacts would have on the offset site and on the adequacy of financial provision for its management. For example, where adjacent land uses have been earmarked for e.g. commercial forestry, settlement, or agricultural expansion, the costs of effective management (burning regime, invasive alien species removal, control of poaching) may increase significantly over time. Local population growth, which is almost inevitable where a major extractive operation is established, must also be factored into offsets planning – whether averted loss or restoration offsets – because of the pressure that population growth will place on the ecological integrity of offset sites.

Facing up to the challenges of restoration

Restoration is an integral step in the mitigation hierarchy, the effects of which must be taken into account in arriving at a measure of residual negative impacts that must be offset. Yet in many areas restoration is an elusive goal owing to slow recovery and restoration rates of habitats and ecosystems, and/or the impossibility of restoration. Restoration is generally considered by experts to be impossible for most ecosystems in South Africa (with one or two exceptions, including wetlands). In addition, rehabilitation options for most terrestrial vegetation types focus on the removal of invasive alien plants and, since landowners are legally required to exercise a 'duty of care' in terms of NEMA, and to control these species on their land (in terms of the Biodiversity Act), offsets that focus on rehabilitation may offer little additionality.

As a result, the offset policy and methodologies supported by experts in South Africa – whilst closely aligned with the BBOP principles overall – diverge somewhat from the NNL principle in that the South African offsetting system is designed to achieve no loss *relative to conservation*

targets for individual habitats and ecosystem types. The aim is to contribute to the conservation estate and achieve persistence above a minimum threshold for all ecosystems and the species they support. Some believe this 'managed drawdown' approach to be vastly more realistic than the purported goals of other systems. Offsetting in South Africa therefore generally focuses on the protection and effective management of good quality extant habitat and ecosystems.

Where restoration is considered feasible, extreme caution must be applied when using predictions of successful restoration as part of the mitigation hierarchy in calculating the residual impact. A risk-averse and cautious approach must be applied, particularly when restoration is doubtful, i.e. success should not be overestimated and residual impacts underestimated. Expert advice is essential to assess the ecological feasibility of any offsetting plan that proposes biodiversity gains through habitat restoration (e.g. in wetland offsetting in South Africa).

Pragmatism and feasibility in offset design are essential

Whilst rigour and defensibility are essential, there is also a strong need to recognise the value of pragmatism across all sectors in offset design. This is particularly true when offsets involve ecological restoration or depend on private landowners' willingness and commitment, and where the size of properties and types of land tenure differ across a landscape and a country. It is essential to know what is required to offset residual impacts to biodiversity, how this can be realistically achieved and within what timeframe, in order that proposed biodiversity outcomes can be met. There have been proposals (e.g. in both WC and KZN guidelines) for an independent and impartial body to be established to advise on offsets – their appropriateness, the adequacy of offset proposals, provision for implementation and so on. This has the potential to strengthen the practicability of offset proposals. Similarly, the national discussions on the biodiversity offset policy framework appear to be considering this option.

In the past the DEA has, in some cases, pushed for the completion of a wetland offset based on restoration actions within an unfeasibly short time frame. Whilst negotiation enabled an extension of the implementation period, this does reflect a lack of understanding of the process of implementing offsets (and ecological restoration in particular) on the part of the regulator, leading to unrealistic requirements. Ongoing capacity building processes and pragmatic, real world implementation insight and experience on the part of the regulator and across sectors will be crucial to support offset planning, implementation and delivery of biodiversity outcomes.

4 CONCLUSION

South Africa is yet to establish any national offsetting legislation or policy. The absence of clear policy has led to inconsistency in the use of biodiversity offsets and left offset requirements as conditions of environmental authorisation vulnerable to legal challenge. However, at provincial level, the development and application of draft guidelines has enabled 'learning through doing', with methods and draft policies that are tailored to local ecological, social and political realities. Moreover, South Africa has some of the best ecosystem mapping and classification in the world with the NBA based on significant, detailed, scientific research. This has underpinned the development and application of technical aspects of offsetting policy and has been a critical enabling factor in the rigorous application of the mitigation hierarchy and design of offsets that are intended to work for biodiversity, not least because the robustness of the science behind the NBA enables challenges by developers to be strongly defended.

The South Africa assessment has highlighted the need for caution when considering the transfer of lessons learnt in offsetting policy development from one country to another because the best

way to design a policy framework (and the regulations to support it) will vary considerably from country to country. In South Africa, it has been possible to create provincial policy that is based on clear, scientifically verified conservation goals for individual ecotypes because South Africa has undertaken long-term, systematic and comprehensive research into the types and statuses of its species and habitats. In other countries with less information about ecosystem health and trends, the goal of an offsetting policy in terms of protection or enhancement of individual ecosystems might be much less clear. In which case, the policy itself would have to be structured very differently.

However, South Africa's experience in the development of offset guidelines and design of projects provides valuable insight into the complex issues involved as well as approaches that have been employed to address them, with important lessons for the development and implementation of biodiversity offsetting in other parts of the world. The importance of establishing national legislation that is stable and provides strength to sub-national schemes has been highlighted. Yet the South African system has also demonstrated that (even in the absence of an overarching national offset policy) existing legislation has allowed for the competent authority to require *evidence* of mitigation measures and offset feasibility within the EIA process and for offset plans to be mandated as conditions within the approval to develop. The integration of offset planning into the EIA process, availability of regional and fine-scale biodiversity plans, and the involvement of independent experts in the drafting of licensing conditions, has further fostered greater emphasis on the early steps of avoidance and minimisation in the mitigation hierarchy, quantification of residual impacts and the assessment and design of offsets as a last resort for addressing residual impacts. This has resulted in offset plans that are more feasible and appropriate and that are mandated through enforceable conditions in environmental approvals.

Barriers to effective offset management, monitoring and enforcement relating to resourcing, institutional frameworks, unrealistic timeframes and uneven capacity across sectors, have been highlighted and must be overcome if offsets are to fulfil their potential as a mechanism for delivering biodiversity outcomes. There is an important role for qualified service providers in this regard to alleviate the burden on under-resourced government agencies. Capacity building across all sectors and a pragmatic approach to offset design will also be essential for the effective implementation of offsets over the short and long term. Moreover, the need for early establishment of financing vehicles that are simple to use, transparent and securely governed is essential for the success of offsetting frameworks, and examples are emerging in South Africa that demonstrate potential for achieving this at the level of individual projects.

5 SELECTED CASE STUDIES

Case study 1: Vele Colliery, Limpopo Province and the challenges associated with retrospective compensation.

The Coal of Africa Ltd (CoAL)'s Vele Colliery in Limpopo Province is a controversial large open cast coal mine located in the buffer area to the Mapungubwe Cultural Landscape World Heritage Site (WHS) and within an area that was initially earmarked for expansion of the Greater Mapungubwe Transfrontier Conservation Area. The mine was closed temporarily in 2010 for non-compliance with environmental and water regulations but reopened after lengthy negotiations^{a,b}. The conditions under which the company was permitted to resume operations included a requirement for a retrospective 'offset'. A legally binding 'biodiversity offset agreement' was eventually signed between the DEA, South Africa National Parks (SANParks) (as manager of the WHS), CoAL and a subsidiary of CoAL, Limpopo Coal Company Proprietary Limited (LCC), in October 2014 (three years after environmental authorisation was issued for LCC to continue with listed activities that were originally commenced without authorisation)^{a,c}.

In this particular case, the situation appears to have been compounded by a failure to consult with interested and affected parties² and a failure (as of May 2015) to release details to the public concerning how, where and when the offset is to be implemented. It is therefore unclear whether the final design of the offset speaks to the impact that it must address, and whether it is sufficient. A Save Mapungubwe Coalition press release issued in October 2014 raised concern that the conditions of the offset agreement are 'vague, inadequate and largely unenforceable' and that whilst 'the primary purpose of the condition requiring the offset agreement was to increase the conservation area of the Mapungubwe National Park and World Heritage Site' ... 'no mention is made in the agreement of any increase in the conservation area'^e. The press release further highlights risk associated with CoAL's well-publicised financial constraints^d, a lack of clarity as to how payment of the instalments will be guaranteed, and how the DEA and SANParks will compel payment should CoAL fail to perform under the agreement^e.

Such post-approval 'offset by negotiation' continues to be an issue in the South African system and, combined in this case with an apparent lack of public disclosure, has fuelled calls for greater transparency in the process of developing the offset agreement. It is also the perception of some stakeholders that the details of the offset are open for future renegotiation, which casts doubt over the outcome.

Offsets that are required retrospectively, as in the Vele case, to rectify a transgression, are not offsets in the truest sense because opportunities for avoidance and mitigation have been entirely missed. Such instances do, however, have the potential to disproportionately influence perceptions of transparency and accountability within the system and to tarnish the extent to which offsets are perceived as a meaningful mechanism for mitigating residual impacts of development.

Information sourced from interviews and publically available documentation:

^a IIED and UNEP-WCMC (2015) Stories of change: Mainstreaming biodiversity and development. IIED, London:

<http://pubs/iied.org/17305IIED>

^b http://www.savemapungubwe.org.za/media_article11.php and

http://www.savemapungubwe.org.za/media_article7.php

^c Biodiversity offsets agreement: <https://www.environment.gov.za/mediarelease/biodiversityoffsetagreement> and https://www.environment.gov.za/sites/default/files/docs/biodiversity_offsetagreement.pdf

^d For example: <http://www.financialmail.co.za/business/money/2013/07/11/coal-of-africa-funding-model-that-works>

^e <http://cer.org.za/news/media-release-save-mapungubwe-coalition-calls-the-biodiversity-offset-agreement-for-vele-colliery-vague-inadequate-and-unenforceable>

Case Study 2: Shaw's Pass road widening, Western Cape Department of Transport and Public Works

The Shaw's Pass project involved widening of a dangerous section of road between Hermanus and Caledon. The provincial roads department was required to offset impacts to a 1ha area of critical habitat, which contained important endemic plant species, at a ratio of 30:1^a. The 30 ha offset site has been secured and protected, reportedly securing an area of the same important habitat as was affected. The land remains with its original owner, who has signed a legal agreement to designate it a Nature Reserve under the stewardship scheme. The landowner will receive annual payments (a 'management fee') for this from the offset fund.

The offset site was under threat from grazing and its protection has been cited by several experts as an example of an offsetting success. Furthermore, successful negotiations between CapeNature (the provincial conservation agency) and the landowner led to an additional 30-40ha, on top of the 30ha offset, being included within the Nature Reserve, and good potential for a further 100ha of threatened habitat to be managed for conservation by the landowner. The habitat in question requires little active management and the nature of the threatened and endemic species (plants) means that the area is considered ecologically viable despite its relatively small size.

However, this is considered by some experts to be a case in which the project should not have received environmental approval. The affected habitat is sufficiently rare and irreplaceable that some believe it should have been declared 'no-go'. Yet many believe that refusal of permissions was never an option, because the project was required on the grounds of public safety (there had been several accidents along that section of road), which is given far higher priority than environmental concerns. This is therefore a case in which extraordinary circumstances allowed for the development despite the consequences for irreplaceable biodiversity.

The offset project took considerable time to be finalised and realised, largely because of protracted disagreements over where the trust fund (required for staged payments for protection and management of the offset site) should be held and which body should be responsible for its management and administration. It was initially deemed impossible for CapeNature (as a government body) to receive and hold a trust fund without breaching the Public Finance Management Act (PFMA) and its founding statutes, and with particular challenges associated with ring-fencing the fund (which would require treasury approval) because at the year end they (like all government bodies) are required to hand back all unused funds to national treasury. Government bodies are also not permitted to make interest on capital, which they would have to be able to do in order to finance the offset over the long term from the trust fund. Eventually, however, an acceptable mechanism was found and a trust fund was established within CapeNature, acting as an important demonstration case for other offset projects proposing that a trust fund be held by a public sector body.

CapeNature now holds a R7.5m trust fund, financed by the provincial roads department, the interest from which will pay for land management on the offset site. The size of the capital in the fund was calculated on the basis of the amount of annual interest that would be needed for land management. Currently that interest is ~R350,000 per year. A portion of the interest is paid directly to the land owner as a land management fee, while another portion is ring-fenced for hiring consultants to undertake specific work such as constructing fire breaks, and cannot be used by the landowner for other purposes. The landowner was required to sign a contract before receiving the first land management payment. The first such payment was released in Q1 of 2015.

Although this case established that CapeNature could hold and ring-fence a trust fund, some experts are concerned about the risk associated with inadequate capacity within the agency to administer such a fund. Within CapeNature itself, there is concern that the administrative burden of holding the fund will be too great, and the organisation is watching this as a test case, to establish whether it has the resources and capabilities to accept other funds in the future.

Offset budgeting included an amount to cover an annual independent financial audit. Alongside that, CapeNature will undertake an annual audit of the land management activities, within its management and monitoring of the stewardship programme, and against the management plan that was drawn up for the site. However, there is no money in the offset budget for CapeNature and the organisation will therefore not receive funds to cover staff time when undertaking this compliance monitoring. Many feel that this is the big catch with the Shaw's Pass case and perhaps an oversight in offset planning and design. CapeNature could not build its monitoring costs into the offset budget because, as government employees, their time cannot be recovered from external sources of finance. This is a problem within the South African system which many say needs to change. As the number of offsets is set to rise, government agencies and regulators are rapidly approaching the point at which they will simply be unable to afford the time it takes to undertake activities associated with compliance monitoring.

Yet others point to the potential for service providers to fulfil this role and report to the relevant authority, in turn reducing the burden on government agencies and allowing them to direct limited resourcing to necessary follow-up and enforcement. There are, however, other activities that only the relevant conservation agency can undertake, such as investigating and preparing a site for its declaration as a protected area, and the subsequent support for its management that is required in terms of any stewardship programme. The additional burden presented by a growing number of offsets could be severe.

Ultimately, Shaw's Pass was hailed a success by conservationists. It seems that this was in no small part due to the various stakeholders involved (CapeNature, the land owner, the Department of Environmental Affairs and Development Planning, the provisional Department of Transport, etc.) and their ability to reach an agreement regarding the details of offset implementation and financing that was satisfactory to all. Other factors to which success has been attributed include the involvement of relatively few people, relatively straightforward offsetting requirements, the small size of the required offset, the drafting of clear and enforceable conditions in the environmental authorisation, and the presence of a willing nearby landowner with the right habitat type on his property.

Information sourced from interviews and publically available documentation:

^a <http://www.capenature.co.za/wp-content/uploads/2013/09/State-of-Biodiversity-2012.pdf>

Environmental authorisation document dated 15 September 2011 for the proposed upgrade of main road 269 (Hemel-en-Aarde Road), Hermanus.

Case Study 3: Gamsberg Zinc Mine, Black Mountain Mining, Northern Cape

The Gamsberg zinc mine is located in the Bushmanland landscape; a semi-desert area in the Northern Cape. It was originally an Anglo American project and has subsequently been purchased and relicensed by Black Mountain Mining (BMM) (a subsidiary of Vedanta). The deposit comprises a steep-sided inselberg in a carter-like structure measuring 7 km x 5 km with a life of mine of ~ 19 years^a. The mining development will involve construction of an open-pit mine and concentrator, plus various additional infrastructure including a tailings dam, waste rock dump, stockpiles, landfill site, evaporation dams, sewage treatment facilities, offices, workshops, construction workers' camps, 15 km of power lines, 60 km of pipelines, and 10 km of new access roads^b.

The mine is in an area of biodiversity importance, situated in the Succulent Karoo Global Biodiversity Hotspot and the Gamsberg Centre of Endemism, which is rich in succulent flora (including rare and endemic species) and a national priority for protected area expansion. Several inselbergs within the concession had already been identified as Critical Biodiversity Areas (CBAs) in the Namakwa Bioregional Plan^b, based on fine-scale vegetation mapping^c. A permanent water 'kloof' on the northern side of the mine deposit is one of three permanent water sources in the Bushmanland region^a. The project will result in residual impacts on these inselbergs, and other important biodiversity features. An offset plan has been developed in order to compensate for residual biodiversity losses.

The Gamsberg offset project was originally a voluntary initiative by Anglo American, which then became mandatory when BMM sought licence renewals under legislation that had changed in the years since. Thus the business case for BMM is clear, with the alternative likely to have been refusal of permits or, at the very least, a much more protracted permitting process. ERM was commissioned to conduct an Environmental and Social Impact Assessment (ESIA) for the project in parallel with a separate Biodiversity Offset Study^a. According to Hughes *et al.*^a the desirability for concurrent studies was based on prior knowledge of the area's biodiversity importance and recommendations by the Northern Cape's Department of Environment and Nature Conservation (DENC).

Temporal overlap between the ESIA and offset planning processes coupled with good communication between the ESIA and offset teams involved have proven critical and highly effective in optimising application of the mitigation hierarchy and demonstrating to the proponent the business case for a smaller offset requirement through avoidance and minimisation of impacts. Hughes *et al.* report that avoidance was focused on assessing alternative locations for mine infrastructure, a waste dump and access road, with habitat sensitivity (based on species rarity, endemism and threat) a primary driver for influencing mine layout. The environmental licensing conditions further specify that areas on the main property that are not being actively mined must be set aside as avoidance zones, and declared as protected areas. Minimisation measures to further reduce residual impacts on biodiversity included increasing the set-back distance between the edge of the open pit and the permanent water body (kloof) and reshaping the slopes of the pit for greater stability; designing sprinkler systems for dust suppression within the open pit; and appropriate management of water to reduce the risk of terrestrial and aquatic habitat contamination. Full ecosystem restoration of disturbed areas was not considered to be an option in these ecosystems.

Offset requirements were calculated based on quantified residual impacts and suitable offset sites were identified using existing fine-scale vegetation mapping of the area and of selection criteria to maximise offset contribution to conservation at least cost (in terms of land-use conflict, purchase and management costs *etc.*). Areas contributing to the maintenance of climate refugia and corridors between habitats were prioritised and set-asides of mine property were considered^a.

Conditions within the environmental licence^e awarded for the proposed mine in 2013 identified four broad habitat classes and included a requirement to secure 2,000 – 4,000 ha of land per habitat class and establish these areas as nationally recognised protected areas. The size of the offset requirement for each ecotype was based on ratios for each affected habitat. These were derived from conservation targets in the national biodiversity strategy, taking into account the proportion of the total remaining extent of that habitat that would be lost as a result of mining and associated activities. Those basic ratios were then adjusted by applying three types of multipliers to account for risks and uncertainties, habitat condition and biodiversity priority. The licensing conditions specify that these areas of land must, as far as reasonably possible, “be contiguous, provide for the persistence of the ecological processes that would maintain the biodiversity features of those habitats and vegetation”, conserve the habitat and species that are of conservation concern and that are likely to be affected by the project, and form one (or if this is impossible, a few) cohesive unit(s) that will be ecologically viable over the longer term and can be managed and protected as such.

BMM are required to secure these areas within five years of commencing project activities. They are also required, again under their licensing conditions, to develop a legal agreement, which they must sign with the provincial Department of Environment and Nature Conservation (DENC), within one year of issuance of the environmental approval. That legal agreement must set out the details of the offsetting plan, including roles and responsibilities, timeframes, proposed sites, predicted biodiversity outcomes, a management plan, a monitoring and evaluation plan, identification of the body responsible for managing the offset sites, a plan for independent third party auditing of biodiversity outcomes every three years, and agreed penalties for breaches of the agreement. It must also set out the financial requirements to secure and manage the land for the life of mine plus 10 years, and a plan for the monitoring and auditing of those financial provisions. Importantly, BMM *were not permitted to commence any activities* until this legal agreement had been signed by both parties.

In accordance with conditions of the environmental authorisation, a legal Biodiversity Offset Agreement was signed in 2014 between BMM and the provincial conservation authority, DENC. It specified that IUCN’s Biodiversity and Livelihood Committee will oversee and audit the offset implementation process for a period of at least five years, subject to renewal^f. The agreement requires BMM to secure the biodiversity offset, transfer land to the provincial conservation authority (DENC), and pay prescribed amounts into a trust. The developer (Vedanta) is contracted to provide a prescribed amount of money per year (for the lifespan of the mine plus 10 years) into a trust in order to secure, establish, rehabilitate and manage offset areas, and that contract is enforceable through any court. Vedanta has also put up surety to protect against a situation in which BMM claims no profits and refuses to pay. If land purchases fail then penalties are payable to the government, who then must use that money to buy the required areas of land.

The Gamsberg offset plan is considered by offsets experts as a ‘gold standard’ example for South Africa, one that recognises offsets as a last resort after every effort has been made to avoid and minimise impacts. The need to avoid irreplaceable habitat was considered in the early planning phases of the project^d. It is one of few real examples in which a practical, “achievable offset has been identified, confirmed and approved, based on an expert-driven process, and subject to a tight agreement between the mining company and regulatory authority”^a within the bounds of legal frameworks and with the conditions of agreement drafted with advice from offsets experts. The offset therefore offers “high potential for successful implementation and securing a protected area for conservation of this unique inselberg region in perpetuity”^a.

There are, however, some important uncertainties that could translate into irreversible loss of biodiversity. Firstly, uncertainty surrounding the potential impacts of black dust on succulent vegetation⁹ largely endemic to this region and the effectiveness of planned mitigation measures (e.g. use of sprinklers when blasting). This led to the precautionary inclusion of additional land for offsetting^a such that other (different) regionally unique succulent communities would be secured as an insurance measure. However, monitoring will be required to assess impacts and whether mitigation and offset measures are adequate. There was also uncertainty around impacts of groundwater drawdown on freshwater habitats and associated vegetation sub-types including risk of extinction for one or two local succulent species^{a,g}. However, ultimately the trade-off between this and securing a major area to protect the critical core of the Bushmanland Inselberg Region (which is currently not protected at all) was viewed as acceptable by all parties. The fact that this is a socially deprived area in need of economic growth means that mining will go ahead, as will a number of other planned industrial projects, so there is some urgency to protect the heart of what is a unique area for biodiversity. The third area of uncertainty related to the sustainability of the Gamsberg offsets over the long term, as there are existing mining rights in the offset areas that could take precedence over surface land rights in the future. Despite agreements to secure and manage the offsets as protected areas it is possible that the long-term security of the offset will be compromised by existing mining rights on the offset sites. There is thus a real risk that offsets will eventually be mined.

Information sourced from interviews and publicly available information:

^a Hughes, J., Ahuja, L., Brownlie, S., Botha, M., Desmet, P. & Heather-Clark, S. (2015) [Using biodiversity plans to guide mitigation and offsets for a zine mine in Northern Cape, South Africa](#). Paper presented at the 35th Annual Conference of the International Association for Impact Assessment. 20-23 April 2015. Florence, Italy.

^b <http://www.vedanta-zincinternational.com/gamsberg-project/>

^c Desmet, PG; Oosthuysen, E and Job, N (2011). Namakwa District Municipality Critical Biodiversity Area Map Technical Report. Northern Cape Province Department of Environment and Nature Conservation (Northern Cape DENC), Directorate: Policy Coordination and Environmental Planning, Springbok.

^d Desmet, PG, Yates, M, and Botha, M. (2005). Bushmanland Conservation Initiative: Spatial Data Report. August 30, 2005. Cited in Hughes *et al.* 2015.

^e Environmental authorisation:

<http://www.erm.com/contentassets/34e202e6c03e4c5f9f0c4338134b71e7/environmental-authorisations/gamsberg-environmental-authorisation-from-denc.pdf>

^f https://www.iucn.org/about/union/secretariat/offices/esaro/what_we_do/business_and_biodiversity/?21700/Black-Mountain-Mining and <http://www.iucn.org/about/union/secretariat/offices/esaro/?14870/IUCN-Black-Mountain-Mining>

^g Botha, M., Desmet, P. & Brownlie, S. (2013) Draft Scope Gamsberg Biodiversity Offset. A report prepared for Black Mountain Mining (Pty) Ltd/Vedanta Zinc International. Draft Version 1. Available from:

<http://www.erm.com/contentassets/34e202e6c03e4c5f9f0c4338134b71e7/final-esia/annexures/annex-f-biodiversity-offset-report.pdf>

6 ACKNOWLEDGEMENTS

We are extremely grateful to the Arcus Foundation for supporting this study. We thank all those who contributed to the assessment of offsets in South Africa through interviews and the sharing of relevant information, insight and experience. Thanks to Alice Bucker and Thomas Maddox for assisting in the preparation of this report. We thank Doug McFarlane and Mark Botha for reviewing an earlier version of this report and providing suggestions and edits to the text. Particular thanks to Susie Brownlie and Amrei von Hase for reviewing multiple versions of the report and contributing to its substantial improvement.

This document is one of a series of outputs from FFI's assessment of biodiversity offset policy and practice.

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www.fauna-flora.org/initiatives/business-biodiversity-resources/

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