Guidance on Good Practice Biodiversity Offsetting in New Zealand

August 2014

Ministry for the Environment
Manatū Mō Te Taiao

Department of Conservation
Te Papa Atawhai

Ministry for Primary Industries
Manatū Ahu Matua

Ministry of Business, Innovation & Employment

Land Information New Zealand
Toitū te whenua

New Zealand Government

Purpose

This non-statutory guidance document (the Guidance) contains an overview of biodiversity offsetting, including its definition, principles, key concepts, application in New Zealand and the steps necessary to demonstrate good practice when choosing to develop and implement a biodiversity offset and achieve no net loss.

The Guidance is designed for policy makers, planners, developers and decision-makers who need to gain an understanding of the concepts and current good practice around biodiversity offsetting.

The Guidance is supported by additional resources and information aimed at a more technical audience such as ecologists, policy advisors and skilled practitioners involved in the design or assessment of a biodiversity offset.

In preparing the Guidance it is recognised that the use of biodiversity offsetting as a policy and consenting tool is new and evolving; particularly under the Resource Management Act 1991, and that it is not possible to predict the challenges and lessons that each new offsetting proposal will bring. Use of the term 'good practice' throughout this document is therefore indicative of our current (2014) understanding of biodiversity offsetting as broadly applicable to most situations. As practices develop and case law becomes more refined, users of this Guidance will need to take that into account.

Preparation of this Guidance is based on approaches to offsetting in terrestrial ecosystems. Offsetting in the offshore marine environment is not considered.

While the Guidance is focused solely on biodiversity offsetting, readers preparing planning documents or participating in consenting processes may wish to familiarise themselves with the full range of approaches available for managing significant effects of activities on biodiversity.

Contents

1. Context: biodiversity in New Zealand

1.1 Introduction

The New Zealand Biodiversity Strategy[1] describes biodiversity as 'the variety of all biological life—plants, animals, fungi, and microorganisms—the genes they contain and the ecosystems on land or in water where they live. It is the diversity of life on earth'.

Most of the diversity of life in New Zealand evolved in isolation after it split off from other continents 80 million years ago. During this period the New Zealand landmass became the stage for the evolution of plants, animals and other life forms that are globally unique.

New Zealand is recognised internationally as a hot spot for biological diversity. For example, New Zealand's only terrestrial mammals (bats) are endemic, as are all four frogs, all 60 reptiles, more than 90% of insects and a similar percentage of marine molluscs; about 80% of vascular plants, and a quarter of all bird species.

The ecosystems in which these species live are also highly distinctive. The kauri forests of the northern North Island, the braided river systems of the eastern South Island, karst, restiad peat bogs, coal measures ecosystems and our geothermal ecosystems are some notable examples.

1.2 Threats

Evolution in isolation means that indigenous plants and animals are vulnerable to interactions with introduced species. New Zealand was one of the last large land areas on earth to be settled by humans. The settlers, and the exotic species they brought with them, have had a dramatic impact on our indigenous biodiversity. Because the New Zealand flora evolved in the absence of mammalian browsers, the introduction of browsers such as deer, goats and possums has substantially changed the composition of much of our indigenous vegetation communities and the flow-on effects extend through their respective ecosystems. Adding to this are the many introduced weed species that compete for resources and alter ecosystem processes in many terrestrial and aquatic ecosystems.

Similarly, many of our animals are not adapted to threats from introduced predators. For example, remaining motionless when disturbed might enable Archey's frogs or New Zealand falcon nestlings to avoid detection by a visually focused avian predator, but is not very effective against an introduced mammalian predator locating prey by scent.

The first phase of the decline in New Zealand's natural biodiversity was the loss of the larger bird species and landscape-scale changes in vegetation structure associated with hunting and burning after humans first settled here. By around 1600, Maori land use practices had resulted in about a third of the original forests being replaced by grasslands, although other habitats, for example wetlands and coastal areas, remained largely unchanged. From around 1850, increasing European settlement of New Zealand resulted in a new wave of forest destruction. Since then, a further third of our original forests have been converted to farmland, and there has been extensive modification or loss of wetlands, dunelands, river and lake systems, and coastal areas. Other bird species, such as the huia and laughing owl, also became extinct during this time.

---

[1] The New Zealand Biodiversity Strategy Action Plan (a non-statutory, whole-of-government strategy) is being refreshed to meet new international obligations known as the Aichi targets.

In the last 800 years, humans and introduced pests have caused the extinction of:

- 32% of indigenous land and freshwater bird species
- 18% of endemic sea bird species
- Three of seven frog species
- At least 12 invertebrate species such as snails and insects
- One fish, one bat and perhaps three reptile species
- Possibly 11 plant species[2]

Despite some success in active conservation and natural resource management over the last three decades, ongoing pressures continue to modify and drawdown New Zealand's biodiversity. Today, our forests are under threat from mammalian browsers, such as deer and goats. Similarly, introduced predators threaten a range of species with extinction, including national icons such as the kiwi. Ongoing land use intensification also poses threats, particularly for freshwater biodiversity.

Natural habitats and ecosystems, as well as species, have become rare and threatened in New Zealand. Historically, New Zealand has focused on protecting alpine areas and native forests, most of which are Crown owned, leaving many other distinctive natural habitats and ecosystems vulnerable to threatening processes. New Zealand's most threatened natural ecosystems are in lowland areas. Once part of more extensive natural ecosystems, these remnants are now generally isolated patches within or on the edge of private farm or forestry lands and receive little legal protection.

Biodiversity management

The goal of the New Zealand Biodiversity Strategy is to halt and, ultimately, reverse the decline in New Zealand's indigenous biodiversity. Significant progress has been made in understanding, managing and reducing the threats to and loss of our biodiversity in the last few decades.

Conservation managers now have access to a suite of well-established methods and tools allowing effective control of many pest species to levels that result in measurable biodiversity gain. During the 1980s and 1990s, New Zealand's legislative and administrative structures relating to the protection of biodiversity and sustainable use of our natural resources were reformed and strengthened. More recently, there has been a groundswell of initiatives by private landowners and communities to protect and restore natural areas, assisted by mechanisms such as the Queen Elizabeth II National Trust, Nature Heritage Fund, and Nga Whenua Rahui.

Advances in our knowledge of ecosystems and improved methods of pest control have resulted in biodiversity gain and contributions to the ongoing recovery of ecosystems across many ecosystem types and spatial scales. Furthermore, the introduction of Systematic Conservation Planning[3] now offers an objective process for prioritising management and optimising resources for achieving national conservation goals.

Biodiversity offsetting in New Zealand should take into account the above context and the design of offsets needs to address the drivers of indigenous biodiversity loss and the tools available to achieve biodiversity gains.

---

[2] Anon 2000. The New Zealand Biodiversity Strategy. Ministry for the Environment, Wellington.

[3] Margules & Pressey 2000.

2. What is biodiversity offsetting?

2.1 Definition

Biodiversity offsetting refers to a process that seeks to counter-balance the unavoidable impacts of development activities on biodiversity by enhancing the state of biodiversity elsewhere.

The Guidance draws from the Business and Biodiversity Offsets Programme (BBOP) definition of biodiversity offsetting to define a biodiversity offset as (emphasis added):

> 'Measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development after appropriate prevention and mitigation measures have been taken. The goal of biodiversity offsets is to achieve *no net loss and preferably a net gain* of biodiversity on the ground'

The BBOP summarises the essence of biodiversity offsets by saying that 'they constitute measurable conservation gains, deliberately achieved to balance any significant biodiversity losses that cannot be countered by avoiding or minimising impacts from the start, or restoring the damage done'.[4]

A number of approaches already exist for quantifying or addressing adverse effects on biodiversity. For example, carrying out assessments of environmental effects, avoiding and minimising adverse effects, implementing management measures (such as pest or weed control programmes, restoration of degraded areas and fencing-off stock from remnant habitats) and monitoring the success of management outcomes.

Although not in itself constituting offsetting, biodiversity offsetting typically incorporates a number of these well-established approaches and processes. However, what differentiates biodiversity offsetting from other forms of impact management is that it requires:

- A mitigation hierarchy to be followed, i.e. offsetting significant residual effects after appropriate avoidance, minimisation and on-site rehabilitation activities have taken place;
- Explicit measurement and balancing of biodiversity predicted to be lost and gained; and
- A goal of no net loss and, preferably, a net gain of biodiversity to be reasonably demonstrated and then achieved on the ground.

Although these three important components are contained in the definition, the BBOP has developed ten principles[5] that underpin offset design and implementation and need to be met for a project to be considered a biodiversity offset.

---

[4] BBOP 2013.To no net loss and beyond: An overview of the Business and Biodiversity Offsets Programme. BBOP, Washington, D.C.

[5] With associated Criteria and Indicators. The full set of Principles, Criteria and Indicators can be found in the BBOP Standard on http://bbop.forest-trends.org/pages/guidelines.

2.2 Principles

Ten principles of biodiversity offsetting have been developed collaboratively by the Advisory Group members of the BBOP (see http://bbop.forest-trends.org/). These principles, presented below as described by the BBOP and explained further in this Guidance, essentially define and underpin the concept of biodiversity offsetting in a global context and form the foundation of this New Zealand-specific Guidance.

The BBOP has also developed a Biodiversity Offsetting Standard (http://bbop.forest-trends.org/pages/guidelines) which sets out how each of these principals should be met. A major failure in meeting any of the principles would mean that a development project would not be considered by the BBOP or this Guidance to be a biodiversity offset (even though the project may still meet statutory tests in New Zealand).

This Guidance document essentially provides a New Zealand context to the BBOP Standard. As such, while it may be challenging for a project to be consistent with all the aspects of good practice described herein, major deviations may indicate that a BBOP principle has not been met.

1. Adherence to the mitigation hierarchy: A biodiversity offset is a commitment to compensate for significant residual adverse impacts on biodiversity identified after appropriate avoidance, minimisation and on-site rehabilitation measures have been taken according to the mitigation hierarchy.

2. Limits to what can be offset: There are situations where residual impacts cannot be fully compensated for by a biodiversity offset because of the irreplaceability or vulnerability of the biodiversity affected.

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

4. No net loss: A biodiversity offset should be designed and implemented to achieve *in situ*, measurable conservation outcomes that can reasonably be expected to result in no net loss and, preferably, a net gain of biodiversity.

5. Additional conservation outcomes: A biodiversity offset should achieve conservation outcomes above and beyond results that would have occurred if the offset had not taken place. Offset design and implementation should avoid displacing activities harmful to biodiversity to other locations.

6. Stakeholder participation: In areas affected by the project and by the biodiversity offset, the effective participation of stakeholders should be ensured in decision-making about biodiversity offsets, including their evaluation, selection, design, implementation and monitoring.

7. Equity: A biodiversity offset should be designed and implemented in an equitable manner, which means the sharing among stakeholders of the rights and responsibilities, risks and rewards associated with a project and offset in a fair and balanced way, respecting legal and customary arrangements. Special consideration should be given to respecting both internationally and nationally recognised rights of indigenous peoples and local communities.

8. Long-term outcomes: The design and implementation of a biodiversity offset should be based on an adaptive management approach, incorporating monitoring and evaluation, with the objective of securing outcomes that last at least as long as the project's impacts and, preferably, in perpetuity.

9. Transparency: The design and implementation of a biodiversity offset, and communication of its results to the public, should be undertaken in a transparent and timely manner.

10. Science and traditional knowledge: The design and implementation of a biodiversity offset should be a documented process informed by sound science, including an appropriate consideration of traditional knowledge.

2.3 Challenges

Biodiversity offsetting is not simple. The complexity of biodiversity means that our knowledge is always incomplete. Information about the biodiversity at an impact site is often lacking, and biodiversity gains elsewhere may be based on predictions of varying accuracy or precision. Offsetting also raises philosophical issues around the extent to which biodiversity should be compared and traded, and science, legal and societal issues around where to offset, how long it will take to deliver biodiversity gains and how much biodiversity should be created to compensate for these factors.

A number of components must be in place for biodiversity offsetting to be achievable and, in some circumstances, it will not be appropriate or possible to demonstrate and then achieve a biodiversity offset. In such cases, alternative approaches to impact management will be necessary.

It should also be remembered that biodiversity offsetting is a developing field and that, while the definition and principles and key concepts are becoming increasingly well established, good practice will continue to evolve and improve.

3. Biodiversity offsetting within the New Zealand legislative framework

There are several laws in place in New Zealand under which biodiversity offsetting may be relevant. It is therefore necessary first to consider the legislative framework to determine whether and how biodiversity offsetting, and hence this Guidance, may be relevant, as it will be different under each Act.

In most cases, formulating and proposing a biodiversity offset to address adverse effects will be a choice by the applicant[6] as a means of meeting or exceeding statutory tests. However, the relevance of biodiversity offsetting and its applicability will be different under each Act.

Resource Management Act 1991. Promotes the sustainable management of natural and physical resources on private and public land.

Crown Minerals Act 1991. Promotes the prospecting for, exploration for and mining of Crown owned minerals for the benefit of New Zealand. The Access Arrangements provisions regulate access to land for mining activity, including on public conservation land.

Conservation Act 1987. The concessions regime governs the majority of activities that can or cannot take place on public conservation land.

3.1 Resource Management Act 1991 (RMA)

The purpose of the RMA is to promote the sustainable management of natural and physical resources. This includes managing the effects of appropriate use, development and protection of natural and physical resources. It applies to land, water and air, including rivers, lakes, wetlands, marine coastal areas, public and private land.

Under the RMA, the most widely applicable form of approval for a development proposal or activity is a resource consent. When considering an application for a resource consent, the consenting authority (regional councils and territorial authorities) must have regard to a wide range of matters including:

- The actual and potential effects (including positive effects[7]) on the environment;
- Measures proposed to avoid, remedy or mitigate adverse effects
- Any relevant provisions of National Policy Statements, National Environmental Standards and the New Zealand Coastal Policy Statement;
- Regional Policy Statements and Regional and District plans;
- Any other matter the consent authority considers relevant and reasonably necessary to determine the application; and
- The purpose and principles in Part 2 of the RMA—including providing for the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna.

---

[6] The term 'Applicant' is used throughout the document to refer to the resource user or developer that may wish to bring forward a biodiversity offsetting proposal as a means of gaining regulatory approval.

[7] In 2013, the High Court in *Royal Forest & Bird Protection Society of NZ v Buller District Council & Ors* [2013] NZRMA 293 determined that biodiversity offsets should be considered as positive effects, and not mitigation. Refer to case law for further interpretation.

Biodiversity offsetting and the RMA

The RMA requires that adverse effects be avoided, remedied or mitigated. However, there is no requirement in the Act to achieve a no net loss outcome in order for a resource consent to be granted. Instead, the decision-maker would generally weigh-up the wide range of matters described above and make an overall broad judgement as to whether a particular proposal meets the requirements of the RMA. The achievement, or otherwise, of a biodiversity offset is not therefore directly analogous to the granting, or otherwise, of a resource consent.

There are, however, two broad potential scenarios under which biodiversity offsetting might be proposed by an applicant seeking a resource consent under the RMA, which make a difference to how a biodiversity offset proposal is considered:

1. Where offsetting is specifically referred to in a planning document such as a district or regional plan

Under this scenario, the applicant and consenting authority are guided on the relevance, necessity and amount of biodiversity offsets and how they are assessed by planning documents including the Regional Policy Statement and Regional or District Plans. An example of such a biodiversity offset policy which has been through the Environment Court appeal process can be found in the Manawatu Wanganui Regional Council's Horizons One Plan[8].

2. Where offsetting is voluntarily proposed as a means of addressing a proposal's effects

Under this scenario, there are no explicit statutory or planning criteria to guide the consent authority in determining whether or not the biodiversity offset is appropriate, sufficient or necessary when considering the application, and when determining any conditions it might impose if it decides to grant consent. Rather, a broad overall judgement is required, weighing the positive (including offsets) and adverse effects in light of the degree of importance of each matter, in accordance with the statutory purpose and criteria of the RMA.

In exercising its overall broad judgement, the decision-maker may wish to be guided by the BBOP Principles as demonstrating international best practice in offsets design. However, there are some key differences between what the BBOP Principles and what the RMA expressly require, (these are set out in Box 1 below).

---

[8] http://www.horizons.govt.nz/about-us/one-plan/. Readers should note that application of the One Plan policy should be read in the context of the subsequent *Royal Forest & Bird Protection Society of NZ v Buller District Council & Ors* [2013] NZRMA 293 High Court decision referred to in the previous footnote.

Box 1: How some of the key BBOP Principles relate to requirements under the RMA

Some of the main similarities and differences with the requirements for biodiversity offsetting and what is required under the RMA are set out below.

Adherence to the mitigation hierarchy

The BBOP mitigation hierarchy consists first of avoidance, then minimisation, then on-site rehabilitation, then, as a final step, offsetting (see Box 2 in Section 7: Following the mitigation hierarchy) for more information on how these terms are defined.

Under the RMA, Section 5(2)(c) requires adverse effects to be avoided, remedied or mitigated. Case law indicates that there is no hierarchy in these terms. However, policy statements and plans are able to express a hierarchy similar to the BBOP hierarchy and, in the same vein, consent conditions may require adverse effects on particular identified features to be avoided, and other effects mitigated or remedied.

The High Court has recently held that under the RMA, offsets are not mitigation and do not address effects at the point of impact; rather, they are better viewed as a positive environmental effect and are able to be taken into account under section 104(1)(a) and section 5(2)[9].

Limits to what can be offset

According to the BBOP Principles there are situations where an impact cannot be offset because of the irreplaceability or vulnerability of the biodiversity affected.

Under the RMA, Section 6(c) requires the recognition of and provision for the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna. Limits can be set out in policy statements or plans such as by requiring avoidance of adverse effects on such areas. Where applicable, these will be relevant factors when considering the impacts of a proposed activity.

No net loss

Under the BBOP, a biodiversity offset should be designed and implemented to reasonably demonstrate that no net loss and, preferably, a net gain of biodiversity can be achieved.

The RMA allows for an overall weighing of the effects, both positive (including offsets where relevant) and adverse. No net loss can be specified in policy statements and plans. Where applicable, these will be relevant factors when considering the impacts of a proposed activity.

Long-term outcomes

Under the BBOP, the design and implementation of a biodiversity offset should incorporate adaptive management, monitoring, evaluation and reporting, with the objective of securing outcomes that last at least as long as the project's impacts and, preferably, in perpetuity.

The RMA provides for such long-term outcomes, including adaptive management, to be achieved through the setting, monitoring and review provisions contained within resource consent conditions.

[9] *Royal Forest & Bird Protection Society of New Zealand Incorporated v Buller District Council & West Coast Regional Council & Ors* [2013] NZHC 1346.

3.2 Crown Minerals Act 1991 (CMA) (access arrangements)

The permission of the relevant land owner is required before a person can enter land to mine for minerals. That permission takes the form of an Access Arrangement issued under the Crown Minerals Act (CMA) for Crown Land. In the case of public conservation land, any Access Arrangement must be granted by the Minister of Conservation and/or the relevant Minister. A concession granted under the Conservation Act (1987) is also usually necessary for access across adjacent public conservation land and for other mining-related activities.

Before granting an access arrangement, the Minister or Ministers must have regard to:

- The objectives of any Act under which the land is administered;
- The purpose for which the land is held;
- Any relevant policy statement or management plan of the Crown;
- The safeguards against any potential adverse effects of carrying out the proposed programme of work;
- The direct net economic and other benefits of the proposed activity;
- For significant mining activities, the recommendations of the Director-General of Conservation and a summary of objections and comments received through public notification; and
- Such other matters as the Minister considers relevant (including compensation).

The Minister(s) may give the above matters such weight as they consider the case merits. None of the criteria automatically operate as a veto. Although there are no statutory criteria around whether or not, or in what circumstances, offsetting is appropriate and sufficient in the context of a proposed access arrangement, a biodiversity offset can be considered by the Minister(s) as a matter of relevance alongside other factors.

3.3 Conservation Act 1987 (CA) (concessions regime)

The Conservation Act (the CA) provides that, other than for specified exceptions, no activity shall be carried out in a conservation area unless authorised by a concession. 'Activity' includes (but is not limited to) a trade, business or occupation, and the provisions also cover the building of structures or facilities. The concessions regime is therefore the primary mechanism for managing commercial (and other) activities on public conservation land.

The primary differences between the CA and the RMA with regard to biodiversity offsetting are:

- The RMA requires decision-makers to take a broad overall judgement which is likely to include social and economic benefits. Such considerations cannot be taken into account under the CA;
- The CA focuses on the values of the land affected whereas the RMA considers the environment more broadly; and
- There are statutory bars to granting concessions that cannot be met using a biodiversity offset.

These differences limit the use of offsetting under the CA.

The CA sets out certain tests that the concession application must meet before it may be granted. In particular, the Minister must decline an application if he or she considers that it does not comply with, or is inconsistent with, the provisions of the CA or any relevant conservation management planning document. The Minister may

decline an activity that is contrary to the purpose for which the land is held. This test recognises that public conservation land is held, and is intended to be managed, for the purposes of conservation.

The Minister may also decline a concession application if there are no adequate or reasonable methods available for avoiding, remedying, or mitigating the adverse effects of the activity that has been applied for. A biodiversity offset proposal cannot be taken into account when making this determination.

Finally, in granting a concession, the Minister may require certain conditions and/or compensation, including for any remaining adverse effects. A biodiversity offset can be considered by the Minister as a form of compensation.

Public conservation land can also be used as a suitable candidate *offset site* (with the approval of DOC), where project impacts occur *off* public conservation land, for example under a management agreement in the context of a resource consent application under the RMA.

4. Key steps necessary for a good practice biodiversity offset

The goal of biodiversity offsetting is to achieve no net loss and, preferably, a net gain of biodiversity. Put simply, offsetting involves exchanging biodiversity lost at one site for biodiversity gains at another site.

As noted above, it is first necessary to consider the legislative framework within which impacts from activities on biodiversity are managed and then determine whether and how biodiversity offsetting may be applicable, and whether alternative approaches should also be considered.

Before a biodiversity offset can be contemplated, a feasibility study should be undertaken to establish the biodiversity values of the proposed site that may be affected by the development. Sometimes the biodiversity that is being affected will be so vulnerable or irreplaceable that its loss would be undesirable, even if it can, theoretically, be offset. Societal values may also result in opposition to a project if the biodiversity is highly valued by the public. Stakeholder engagement is therefore encouraged throughout the offset process.

For some types of biodiversity there may not be sufficient knowledge to assess whether the measurable biodiversity gains necessary to reasonably demonstrate no net loss can be achieved. This means that there are limits to offsetting caused by a lack of knowledge. It is also possible that limits to offsetting may exist if an appropriate offset site is not available. Consequently, a good practice offset will not always be possible and it may not be considered appropriate by the developer or the decision-maker to proceed with the development as initially planned. It may be necessary to refine the project to avoid non-offsetable effects and reduce the residual adverse effects to a level that is offsetable. These and other limits to offsets are discussed in Section 6.2.

Having identified a project site that avoids non-offsettable impacts, all reasonable steps should then be taken to follow the mitigation hierarchy and further avoid, minimise or remedy any adverse effects on all biodiversity at the impact site.

Following the mitigation hierarchy and recognising limits to offsetting can be thought of as prerequisites that must be demonstrated before a good practice biodiversity offset can be developed. Any residual adverse effects can then be considered for biodiversity offsetting.

The first step in designing an offset is to adequately describe the biodiversity that will be destroyed or modified by the development, either directly or indirectly, including collecting data on what is there. Calculating no net loss requires choosing a currency that can be used to categorise biodiversity into units to describe what has been lost and gained. Inevitably, this requires simplification of the biodiversity and may involve using proxies/surrogates or other recognised scientific approaches.

A fair means of exchanging losses at one site for gains at another site must be developed so that no net loss can be demonstrated in a manner that achieves ecological equivalence (see Section 8.1) and social equity (see Section 8.4.5). Factors such as time-lag between biodiversity loss and gain occurring, geographical distance, similarity of biodiversity between impact and offset sites, effects on the landscape and uncertainty over success may influence the offset location or even prevent an offset being used altogether.

The offset site is where biodiversity gains must be realised. Crucially, these must be additional biodiversity outcomes that would not have occurred in the absence of the offset.

Finally, there must be some form of assurance that the biodiversity gains at the offset site will be realised and that the offset will achieve long-term outcomes. Offset sites must therefore be monitored, management targets and other requirements must be enforced and funding must be ensured for the lifetime of the offset.

The remainder of the Guidance provides more detailed information on good practice for each of these key components, as set out in Figure 1.

Further technical details on the biodiversity offsetting process can also be found in the accompanying Decision Support Tree[10].

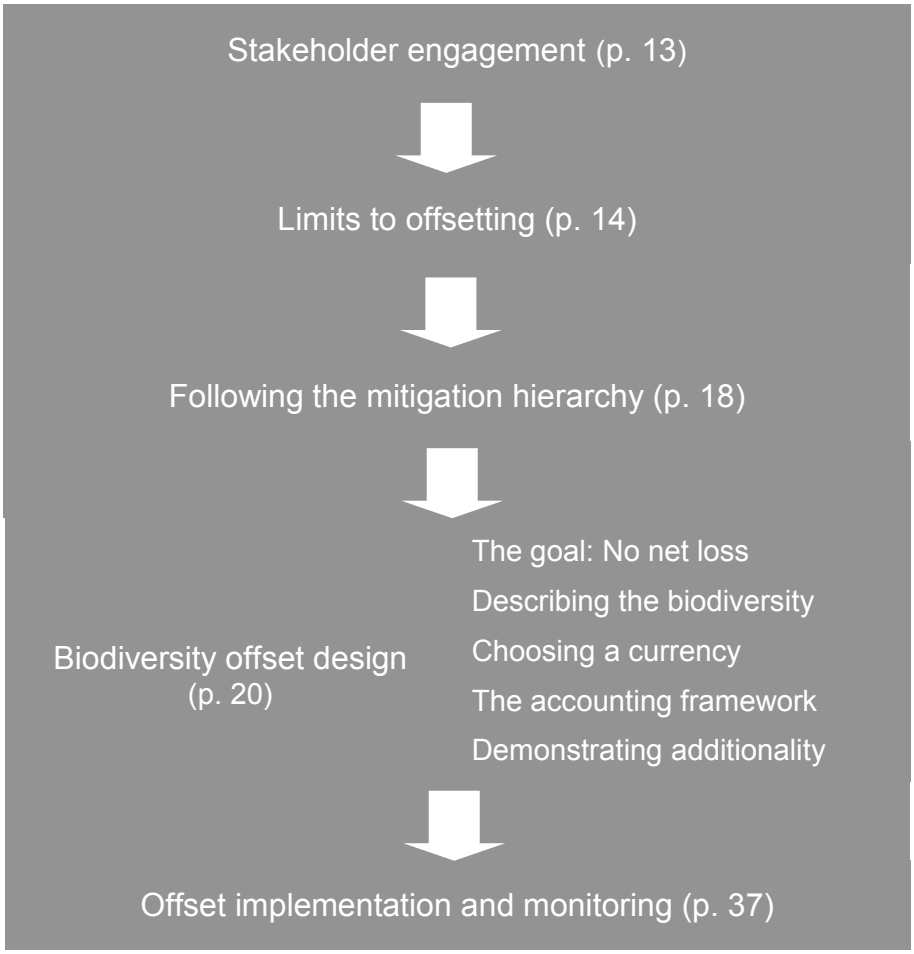

Figure 1: Structure of Guidance on Good Practice Biodiversity Offsetting in New Zealand.

[10] Highlighted text indicates a link to a technical support document providing more information on that particular topic. These documents are available on request for you to review and have also been through the same stakeholder consultation process as the Guidance.

4.1 Stakeholder engagement

Good stakeholder engagement addresses the BBOP principles of stakeholder participation, transparency and equity.

This principle requires a willingness to engage with an open mind and to reasonably consider stakeholder views. It recognises that full stakeholder agreement, while desirable, may not always be possible despite an offset proponent's best endeavours. To demonstrate adherence to this principle it is therefore important to document that an adequate process of engagement has been followed and that stakeholder views have been fully considered.

Stakeholder engagement is often set out in legislation governing development activities. The RMA provides for differing levels of stakeholder engagement for activities, ranging from no public notification of applications through limited notification and then full notification. It requires a party to be identified by the applicant where they are directly affected by the activity.

For example, the RMA does not specifically require an applicant to consult with an affected party (an applicant must, however, detail any consultation that it decides to undertake).There are times when additional wider public engagement will be beneficial to the developer and stakeholders. Accordingly, where an offset proposal is being considered as part of an application, it is good practice to include that proposal in the consent application.

Good stakeholder engagement has the additional benefits of bringing information from the community to the project (e.g. what the community cares about), which may help to ensure that the assumptions used in designing biodiversity offsets are well supported. Often, projects that have been informed by community and stakeholder groups prior to resource consent applications being lodged achieve better outcomes, with fewer appeals to the Environment Court.

Stakeholders should be provided with the opportunity to engage in the ongoing monitoring and evaluation of the success of the biodiversity offset, such as being kept regularly informed and having access to monitoring information. Such ongoing participation is often helpful to a development project, as stakeholders are more likely to be supportive if they feel involved and know and understand the project.

Finally, stakeholder engagement is not a replacement for decisions informed by sound ecological knowledge and good practice. Care should be taken to ensure that a reasonably demonstrated no net loss outcome will still be achieved while considering the views and aspirations of stakeholders.

It is *good practice* to:

- Identify relevant stakeholders and engage with them early in the process;
- Identify and engage with all relevant whānau, hapū and iwi that may expect input and participation in the process;
- Taking into account the scale and nature of impacts, provide and communicate appropriate opportunities for stakeholders to engage throughout the biodiversity offsetting process, including site selection, offset design, no net loss calculations, implementation and monitoring; and
- Refer to any relevant guidelines on good consultation such as the RMA Quality Planning resource (www.qualityplanning.org.nz).

4.2 Limits to offsetting

Limits to offsetting is a BBOP principle.

Sometimes a biodiversity offset will not be appropriate or possible due to the important biodiversity values present at the site and an unacceptably high risk of permanent and irreplaceable loss of those values if an offset is not successful. In such cases, where no net loss cannot be confidently predicted or demonstrated, a biodiversity offset will not be an appropriate mechanism to address a project's adverse effects.

The applicant would then have a choice of:

- Redesigning the project to avoid impacts on high-value biodiversity that cannot be offset (in order to still achieve a biodiversity offset); or
- Proceeding with the development proposal and offering a package of measures to compensate for residual adverse effects that cannot be avoided, remedied or mitigated (but would not be a biodiversity offset).

In the latter case, there would be a risk that should be acknowledged that valuable biodiversity may be lost as a result. Nevertheless, the project may still meet statutory tests if the relevant legislation or planning documents do not require no net loss to be demonstrated.

A framework for assessing limits to offsetting

Emerging international good practice supports a framework for assessing when biodiversity offsetting may not be appropriate, or when a high level of proof is required to demonstrate that a successful offset is likely.

The framework involves:

1. Establishing biodiversity values, including assessing their vulnerability and irreplaceability;
2. Assessing the likelihood of success of an offset; and
3. Combining biodiversity value and likelihood of success to determine an appropriate level of proof that a successful offset outcome is likely.

The framework can be used as a guide to assist applicants, decision-makers and stakeholders to reach a level of confidence that a project's significant residual impacts can be feasibly offset. Determining appropriate limits to offsetting minimises the risk of irreplaceable biodiversity loss.

The framework can be iteratively applied as information improves during project design. However, there is considerable benefit in starting the process early by undertaking an initial assessment of limits to offsetting during the project pre-feasibility stage. This can help to identify possible impacts on high-value biodiversity where an offset may not be feasible and where avoidance of those biodiversity features may be a better option to deliver no net loss, thus limiting offsets to residual effects that are demonstrably offsetable.

The key components of the framework are set out in more detail below.

4.2.1 Establishing biodiversity values

'Biodiversity value' refers to the importance of a particular biodiversity component or assemblage. Importance may be derived from:

- Its contribution towards the maintenance of biological diversity; or
- Its importance to society for reasons such as its intrinsic values, beauty, utility or cultural significance.

Biodiversity values tend to be inextricably linked with concepts such as rarity, vulnerability, irreplaceability, and complexity. In general, the more vulnerable or irreplaceable the biodiversity, the greater the risk of loss associated with project impacts and the less likely that an offset can be achieved.

This concept can be shown in Figure 2:

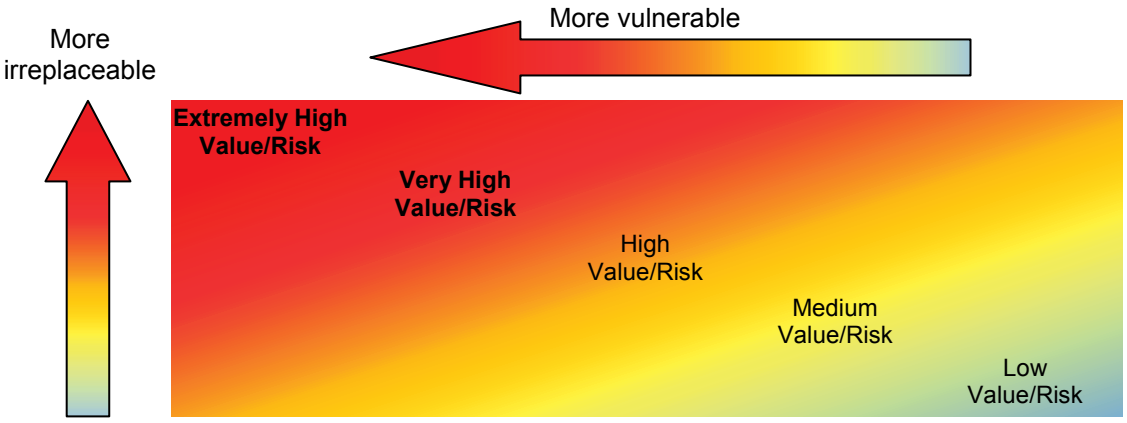

Figure 2: The value of biodiversity increases as vulnerability and irreplaceability increase; this also increases the risk that a biodiversity offset cannot be achieved.

There are a number of classification systems that can be used to assess the degree of vulnerability or irreplaceability of biodiversity in New Zealand, and to assist in determining its risk category. For example:

- New Zealand Threat Classification System. Provides an assessment of the vulnerability of New Zealand species by considering historical decline, current threats and population trajectories; and
- Threatened Environment Classification. Provides an estimate of historical indigenous vegetation loss, whether indigenous vegetation in a particular land environment is widespread or restricted (hence more vulnerable) and whether or not it is protected.

4.2.2 Assessing the likelihood of success of an offset

The likelihood of success of a biodiversity offset is influenced by:

- The magnitude of the impact;
- The opportunity to offset at another suitable site; and
- The feasibility of delivering the offset.

The magnitude of the impact

Impact Magnitude comprises three elements:

1. Severity—intensity of effects at a defined (usually spatial) scale;
2. Extent—the scale of expected impacts, as a proportion of population or range of a given biodiversity feature (e.g. a threatened species or community type); and
3. Duration—the temporal scale of impacts ranging from short-term to permanent.

As the magnitude of impact increases, delivering a successful offset becomes more difficult, and the risk of its failure increases.

When assessing the magnitude of impact, the focus should be on the highest value biodiversity. In cases where there are multiple high-value biodiversity values, an assessment of each high-value component may be appropriate. Where adequate information is lacking, adopting a precautionary approach can help to limit offset failure.

Offset availability

The ability to deliver an offset depends on the availability of sites and management actions that offer suitable opportunities for achieving comparable, additional, lasting biodiversity gains.

Opportunities are likely to be greater where similar biodiversity occurs naturally near the impact area and where there is capacity to achieve biodiversity gains, such as through restoring a degraded habitat.

Offset feasibility

Offset feasibility refers to the ability of a proposed offset to deliver lasting biodiversity gains. It requires demonstrated evidence that the proposed offset techniques can deliver the required gain (i.e. they are known to work), sufficient technical capability of applicants and offset implementers, timely commencement of offset delivery and long-term financing until no net loss is achieved.

Offsets will be most feasible where offset techniques are well developed and proven, where biodiversity is of relatively low complexity, where offset proponents and implementers can document proven experience, and where secure, long-term financing for both offset implementation and outcome monitoring is in place at the outset.

4.2.3 Determining the burden of proof that an offset is possible

The burden of proof framework combines biodiversity value with likelihood of offset success to assess the level of proof required for an offset to be considered feasible.

Where biodiversity values are low or where management techniques are well established, a lower burden of proof that an offset will be successful can be appropriate.

Where biodiversity is relatively more complex or where management techniques are less well developed, a higher burden of proof should be demonstrated. An applicant would need to allow sufficient time in the regulatory process to demonstrate feasibility. In some cases this might require that effects are offset prior to initiating the development or in situations where an acceptable burden of proof cannot be established that supports the feasibility of achieving no net loss, a good practice biodiversity offset will not be possible. This is illustrated by Figure 3:

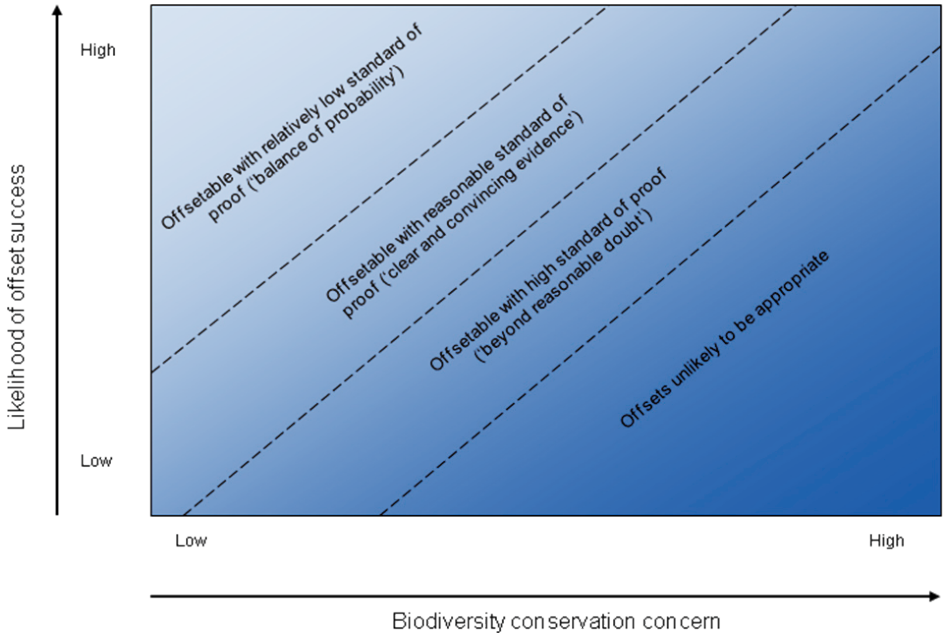

Figure 3: Burden of proof framework, combining biodiversity value and likelihood of offset success (after Pilgrim et al. 2013).

It is *good practice* to follow the framework on limits to offsetting proposed above.

Further detailed information can be found in the technical guidance on Limits to offsetting in New Zealand.

4.3 Following the mitigation hierarchy

Adherence to the mitigation hierarchy is a BBOP principle.

Avoiding or minimising adverse effects provides greater certainty that biodiversity values will persist despite project development, because it is easier and more certain to retain biodiversity than to attempt to recreate biodiversity values elsewhere through an offset. Biodiversity offsetting is therefore the final step in the mitigation hierarchy.

Prior to considering a biodiversity offset for a specific project it is necessary to address adverse effects on site by:

- First avoiding or preventing impacts from occurring (e.g. re-routing a road to avoid high value biodiversity);
- Where avoidance is not reasonably practicable, impacts should be minimised (e.g. reducing the footprint of the activity to minimise the area of indigenous vegetation impacted); and
- Rehabilitating and restoring on-site biodiversity from temporary impacts associated with the activity.

Plans to avoid, minimise, and remedy biodiversity impacts should be made as early as possible in the project planning cycle so as to minimise the risk that residual adverse impacts on important biodiversity are not able to be offset. For example, the application of the mitigation hierarchy can be integrated into the Assessment of Environmental Effects (AEE).

Because valuable biodiversity may be discovered throughout the planning phase, such as during fieldwork, following the mitigation hierarchy is likely to be iterative. Documenting changes to project design can also help to demonstrate adherence to the mitigation hierarchy.

Once all reasonable measures to avoid, minimise and remedy adverse effects have been proposed, any significant residual adverse impacts can then be considered for biodiversity offsetting.

It should be noted that the term ‘significant residual adverse impacts’ is taken from the BBOP and is not analogous to the use of the term ‘significant’ under the RMA or the CA. Rather, it can be thought of as referring to effects that are ecologically meaningful or of non-minor ecological importance. This would need to be determined on a case-by-case basis. Box 2 provides a comparison of BBOP and RMA terminology with respect to the mitigation hierarchy.

If the total residual impact is very small (taking into account that a number of small effects may still accumulate into a significant effect), it may not be worth the investment in a comprehensive good practice biodiversity offset, particularly if the relevant legislative tests allow for minor adverse effects to occur.

It is *good practice* to:

- Avoid, minimise and remedy adverse effects before contemplating a biodiversity offset;
- Undertake a risk assessment at the earliest possible stage in the development planning process, to determine whether non-offsetable impacts are likely. If possible, carry this out at the project feasibility stage, so that the results can contribute to early decisions concerning the future location and risk profile of the project;
- Limit and manage the risk that impacts cannot be offset, such as by modifying the design of a project to avoid areas of highly irreplaceable or vulnerable

biodiversity, or take measures to improve the chances of a successful offset being achieved; and

- Keep a record of modifications to the design of the development, including which modifications were implemented to specifically address and reduce impacts on biodiversity. This may help to demonstrate adherence to the mitigation hierarchy.

Box 2: BBOP and RMA terminology and the mitigation hierarchy

Box 1 (Section 3) sets out some of the similarities and differences between application of the mitigation hierarchy under the BBOP and under the RMA. In addition, the BBOP and the RMA do not use exactly the same terms when describing the mitigation hierarchy. This can be confusing when attempting to apply biodiversity offsetting to a resource consent proposal or when considering provisions for offsetting in a Regional Policy Statement or Regional or District Plan.

The **BBOP** describes the mitigation hierarchy as: avoid, minimise, remedy, offset (with remedy being used somewhat interchangeably with on-site rehabilitation/restoration). These terms are defined by the BBOP as follows:

Avoidance: measures taken to avoid creating impacts from the outset, such as careful spatial or temporal placement of elements of infrastructure, in order to completely avoid impacts on certain components of biodiversity. This results in a change to a 'business as usual' approach; for example, re-routing of roads to avoid the most sensitive areas.

Minimisation: measures taken to reduce the duration, intensity and/or extent of impacts that cannot be completely avoided, as far as is practically feasible; for example, retaining wildlife corridors to reduce impacts of roads.

Rehabilitation/restoration (remedying): measures taken to rehabilitate degraded ecosystems or restore cleared ecosystems following exposure to impacts that cannot be completely avoided and/or minimised; for example, replanting roads that are no longer required or were widened to accommodate trucks carrying construction materials.

Offset: measures taken to compensate for any residual significant, adverse impacts that cannot be avoided, minimised and/or rehabilitated or restored, in order to achieve no net loss or a net gain of biodiversity.

Under the **RMA** the terms avoid, remedy and mitigate are used. 'Avoid' and 'remedy' are essentially analogous to the BBOP definitions. Mitigate is *similar to* the BBOP concept of minimisation[11] (although the BBOP explicitly builds in an element of practicality to this definition). However, notwithstanding the above, readers should refer to current case law for guidance on how 'offsetting' is to be taken into account in RMA decision-making.

[11] This document reflects case law as at 2013. For example, *Royal Forest & Bird Protection Society of NZ v Buller District Council & Ors* [2013] NZRMA 293.

4.4 Biodiversity offset design

This section of the Guidance focuses on the steps necessary when designing a biodiversity offset, the key components of which are[12]:

1. The goal: no net loss and preferably a net gain in biodiversity;
2. Describing the biodiversity: what to count and measure at the impact and offset sites;
3. Choosing a currency: to allow biodiversity to be categorised and exchanged;
4. The accounting framework: to help define the size, specification, location and successful implementation of the offset; and
5. Demonstrating additionality: how biodiversity gains are achieved and demonstrated at the offset site.

Good practice relating to each of these is set out below.

4.4.1 The goal: no net loss and, preferably, a net gain in biodiversity

The goal of biodiversity offsetting is to achieve no net loss and, preferably, a net gain of biodiversity on the ground, with respect to:

- Species composition (e.g. individual species or species groups)
- Habitat structure (e.g. vegetation tiers)
- Ecosystem function (e.g. nutrient cycling rates)
- People's use of and cultural values associated with biodiversity (e.g. particularly valued habitats or species).[13]

No net loss, in essence, refers to the point at which biodiversity gains from targeted biodiversity management activities match the losses of biodiversity due to the impacts of a specific development project, so that there is no net reduction in the type, amount and condition (quality) of biodiversity. A net gain means that biodiversity gains exceed a specific set of losses associated with a development. Figure 4 provides a simplified example of this concept.

[12] BBOP 2012a. Business and Biodiversity Offsets Programme (BBOP) 2012. Resource paper: No-net loss and loss-gain calculations in biodiversity offsets. BBOP, Washington, D.C. http://bbop.forest-trends.org/pages/guidelines

[13] No net loss and loss-gain calculations in biodiversity offsets, BBOP 2012 (http://www.forest-trends.org/documents/files/doc_3103.pdf)

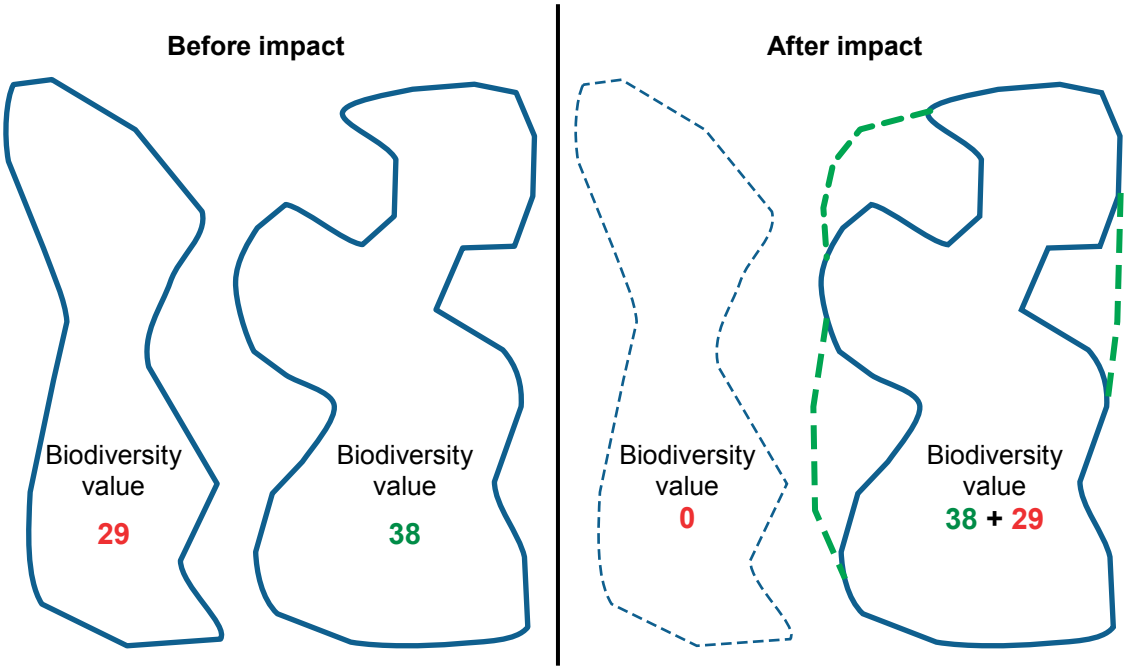

Figure 4: Simplified illustration of the goal of no net loss of biodiversity values. Values are lost due to the impact of the development and gained through management actions to improve the area and condition of the offset site.

Demonstrating no net loss is challenging. Biodiversity is enormously complex, and it is not possible to measure it completely or exactly. Furthermore, no two components of biodiversity are identical. At one end of a continuum, two components will be very similar (e.g. individuals of a kiwi population living in the same forest) whereas at the other end of the continuum dissimilarity is very high (e.g. beech forest and a peat bog). Because biodiversity exists along similarity/dissimilarity continua, losses at an impact site will never be *exactly* the same as biodiversity gains at an offset site.

Demonstrating no net loss therefore requires biodiversity to be simplified into units that can be measured, compared and subsequently balanced at impact and offset sites. For these reasons, biodiversity offsetting will always be an *exchange* of biodiversity between impact and offset sites, and no net loss can only ever be *reasonably demonstrated*.

Like for like

A ‘like for like’ biodiversity offset is based on the evaluation and comparison of the same environments and the same ecosystems, vegetation, and habitats, and species existing in them. In contrast, ‘like for unlike’, also known as ‘out of kind’ exchanges are those where the biodiversity type being gained is considered to be different to the biodiversity type being lost (e.g. 5 ha of lowland podocarp forest exchanged for 5 ha of beech forest, or coal measures vegetation exchanged for kiwi management elsewhere).

A key concept explicitly linked to demonstrating no net loss is that biodiversity exchanges should be ‘like for like’. This is because as the degree of dissimilarity between the biodiversity components being lost and gained increases, the more difficult it becomes to replace all the components lost because they may not exist at the offset site. No net loss for ‘out of kind’ exchanges is difficult to demonstrate because, currently, there is no accepted robust method for comparing and exchanging different types of biodiversity.

The biodiversity offset process therefore requires that every reasonable effort is made to ensure that biodiversity gains and losses are as comparable as possible both in ecological terms and from a conservation-priority perspective. This requires adequate knowledge and quantification of biodiversity at impact and offset sites which, in turn, means that an AEE must be designed to be 'fit for purpose' with respect to offsetting. This means that the level of information contained within an AEE needs to be sufficient to support an offset's design.

As a minimum, it is *good practice* when demonstrating that a biodiversity offset is like for like that no high-value indigenous components and no indigenous types should be substituted for other components or types. Biodiversity components and types are explained further in the next section.

An applicant may decide that it is not feasible to demonstrate no net loss at a project level, in which case the project as a whole would not be considered to be a biodiversity offset. However, an applicant may still wish to highlight that no net loss has been demonstrated for a subset of types and components as part of a proposed package of measures to address adverse effects.

Achieving a net gain through 'trading up'

As noted above, there is currently no methodology for robustly comparing losses and gains for different types of biodiversity. This means that their exchange inevitably results in some loss of the biodiversity type being impacted. A like for unlike exchange is not therefore considered to be a no net loss biodiversity offset although, depending on the circumstances, it may still contribute to conservation gains at the offset site.

There may be times when biodiversity being lost is *of low value*, both to stakeholders, and from an ecological or conservation perspective. This might be because the biodiversity is very common, widespread and not the best example in the local area. In these circumstances, if the impact is such that a biodiversity offset is still considered to be desirable or necessary, there may be greater benefit from managing biodiversity of demonstrably higher conservation value at an offset site and a 'like for like' exchange may not be the preferred way of addressing adverse effects.

While it may not be possible to robustly demonstrate no net loss or net gain on a like for unlike basis (it could not meet the good practice definition of no net loss, which applies to like for like exchanges), an overall net gain could be *deemed* to have been achieved if the biodiversity being lost is of low value and the biodiversity being gained is clearly of a much higher value and the amount gained is reasonably of the same or greater magnitude[14].

This might be achieved through expert opinion and would benefit from stakeholder agreement for the exchange to be able to demonstrate that it is socially equitable. It would also need to be consistent with statutory tests. In these circumstances, a like for unlike exchange (i.e. exchanging low-value biodiversity for high-value biodiversity of another type) could be considered to be a biodiversity offset consistent with good practice, provided that all other principles have been met.

[14] See BBOP (2012). Resource paper: no net loss and loss-gain calculations in biodiversity offsets. BBOP, Washington D.C. http://bbop.forest-trends.org/pages/guidelines

4.4.2 Describing the biodiversity

Adequately describing the biodiversity at the impact and offset sites, including categorising and measuring it, is crucial for capturing the full range of biodiversity values that need to be exchanged to achieve a like for like, no net loss biodiversity offset.

This process normally requires an assessment of the size of the area, the type of biodiversity present and its condition (quality). Measuring condition is important because biodiversity gains at an offset site are often achieved through improving or enhancing the condition of biodiversity at existing habitats, e.g. improving the quality of vegetation by removing browsers.

Sometimes data will not exist to adequately describe the biodiversity present and decisions will have to be made as to how much new information to collect. Although cost and time will often be factors in this decision, they should be weighed against the need to adequately measure biodiversity losses and gains, so that no net loss can be demonstrated.

There are three main hierarchical levels used to categorise biodiversity in the design of an offset:

- **Biodiversity type** is the highest level and describes the key biodiversity features found at a site. For example, lowland podocarp-hardwood forest, coal measures vegetation, or a river and riparian ecosystem. It may also include threatened and iconic species and rare or special features.
- **Biodiversity components** help describe what makes up the biodiversity type. For example, vegetation tiers (e.g. ground, understory, canopy, epiphyte, climber), habitat types (e.g. lizard habitat, inanga spawning areas), related groups of indigenous species (e.g. vertebrate, invertebrate, bird, bat, lizard), or functional roles (insectivore/predator, nectarivore/pollinator and frugivore/seed disperser). Biodiversity components are likely to be affected in different ways by a development or by management. For example, some vegetation tiers may be more affected by browsing pest animals than others, depending on their species composition and palatability.
- **Biodiversity attributes** quantify the condition or the quantity of the biodiversity. These are the measures that are balanced in an accounting system to demonstrate no net loss. Examples include the number of trees per tier or the number of birds detected per hour. Each biodiversity component will have at least one attribute, and may need several attributes to fully ‘capture what we care about’. No net loss can only be demonstrated for attributes that are measured at impact and offset sites and balanced in an accounting system.

It is *good practice* to:

- Describe the full range of biodiversity types, including:
  - The extent of all indigenous vegetation and habitat types.
  - Important (abundant), threatened or rare, characteristic or distinct plant and animal species within each vegetation or habitat type.
  - Rare or special features.
  - Species or ecosystems particularly valued by stakeholders.
  - Biodiversity that may be outside the impact site such as upstream and downstream connectivity for mobile or migratory species.
  - The range of biodiversity components, with an emphasis on ‘high value’ indigenous components.

- When measuring attributes:
  - Describe a sufficient number to 'capture what we care about' and to demonstrate that the good practice definition of no net loss has been met.
  - Take into account ecological function. For example, split out and separately count and represent trees, saplings and seedlings for long-lived tree species, or consider hydrological pattern for wetlands.
- When there are data gaps and collection of data is difficult or prohibitively expensive:
  - Focus on gathering data on high-value indigenous components.
  - Use objective counts and measures wherever possible (e.g. counting individual saplings, or population density and distribution of fauna).
  - Consider using expert elicitation or expert agreement and address uncertainty were data cannot be gathered.
  - Acknowledge situations where subjective decisions and assessments cannot be avoided and have been used. Record and assess the uncertainty that this creates when calculating no net loss.
  - Where critical data are missing and cannot be gathered or reliably estimated, accept that this may prevent the project from the balancing of losses and gains required to demonstrate no net loss, and therefore from achieving a biodiversity offset. Acknowledge that biodiversity loss may be the result if the development proceeds as planned.

4.4.3 Choosing a currency

Information about the biodiversity values at a site must be converted into a currency, to allow for biodiversity values to be measured and compared at impact and offset sites, so that no net loss can be demonstrated.

Converting biodiversity information into a tradable currency inevitably requires a degree of simplification of the biodiversity present[15]. For example, some currencies use species to represent genetic diversity, or vegetation communities to represent species composition, or indicators or surrogates to represent groups of species or community health.

It is the currency, rather than the underlying biodiversity, that is used as the basis for determining no net loss. It is therefore important that when selecting a currency, important biodiversity values are not lost and that the good practice definition of no net loss can be reasonably demonstrated.

Types of biodiversity offsetting currencies

There are a number of currencies that have been developed, or are in the process of being developed, around the world. Each currency has its own advantages and disadvantages, often representing a different trade-off between simplicity and practicality or comprehensiveness. The main types of currencies used in New Zealand as at 2013 are described below.

Area

The simplest type of currency is one that measures the area of biodiversity being lost and requires that a similar area, or some predetermined multiple of it, should be gained (e.g. protected from imminent loss or improved).

[15] Walker et al. 2009; Gardener et al 2013; Salzman & Ruhl 2000.

This type of currency does not make any attempt to take into account differences in amount, type and quality of biodiversity between the impact site and the offset site, or the value of that biodiversity. This means that any rare and vulnerable biodiversity (such as threatened species) that may be present will be protected only by chance.

Area and condition

Area x condition currencies measure the area of each biodiversity type and multiply this by a condition score relative to an agreed ecological benchmark. These measurements are often combined to generate one or more 'scores' representing the amount of biodiversity being lost and gained. For example, some hectares of mānuka scrub of a certain age structure and stem density.

Depending on the currency, and any exchange restriction rules that are applied[16], the scores for biodiversity lost and gained can either prevent or allow losses in area to be made up for by gains in condition, or for one type of biodiversity to be exchanged for another type of biodiversity.

Context-dependent

Context-dependent currencies attempt to assess biodiversity losses and gains in terms of their contribution to conservation priorities. For example, whether there would be a loss or a gain in the long-term viability of a particular species, or the value of a site as a contributor to national biodiversity conservation goals, such as contributing to maintaining a representative range of ecosystems.

Choosing the right currency

No single currency is adequate to account for all affected biodiversity. Because currencies form the basis for biodiversity exchange, the choice of a good currency is essential to guard against the failure of an offset to meet no net loss.

Key factors in the choice of a currency include:

- **Transparency**. Does the currency allow for losses and gains of each biodiversity type and each high-value biodiversity component to be assessed?
- **Robustness**. Does the currency contain assumptions that when tested, including on the sensitivity of key assumptions, present consistent results?
- **Fit for purpose**. Does the currency capture the biodiversity 'we care about' necessary to demonstrate no net loss? Is the currency well tested?; and
- **Cost-effectiveness**. Is the currency appropriate for the scale of effects or the type of impact? Does the complexity of the currency match the complexity of the biodiversity?

Sometimes it may be necessary to use a number of complementary currencies; in particular, when there are many biodiversity types involved. For example, aquatic and terrestrial biodiversity is unlikely to be captured adequately by the same currency.

All currencies have drawbacks and shortcomings and there are often choices to be made around specifying appropriate parameters around how and what to measure.

Sometimes no currency will adequately capture the range of biodiversity value present at the impact site.

Ultimately, the currency or currencies must be scientifically defensible as a measure of the biodiversity being destroyed or created. A good currency should capture the type, amount and condition of the biodiversity that is being lost and gained.

---

[16] See next section

It is *good practice* to:

- Use a currency (or complementary currencies) commensurate with the scale, intensity and complexity of the adverse effect and the biodiversity affected;
- Explain which currency (or complementary currencies) was used to evaluate the biodiversity offset and why this was the most appropriate one (including acknowledging any flaws or limitations);
- Reasonably demonstrate the good practice definition of No Net Loss, that '*no high value indigenous components and no indigenous types should be substituted for other components or types*';
- Encourage and provide a forum for stakeholders to review and comment on the parameters, measurements and currencies used, and to be open to incorporating any suggestions; and
- Consider the model output as a guide to the likelihood of achieving no-net-loss rather than as an explicit result.

Further technical information and guidance on choosing the appropriate currency is provided in Currencies and Accounting Systems.

4.5 The accounting framework

Whereas currencies define what is being lost and gained, the accounting framework helps to determine the size and location of the offset site and the type and amount of activities that can best deliver biodiversity gains, while also achieving broader outcomes such as stakeholder equity and landscape-scale benefits. It is a key step in the process in which biodiversity losses and gains are balanced to reasonably demonstrate that no net loss will be achieved.

Good practice relating to all these issues is presented in the following sections:

1. Achieving biodiversity gains
2. Similarity and equivalence of biodiversity being exchanged
3. Biodiversity in the landscape
4. Managing risk of failure and uncertainty of outcome
5. Stakeholder equity

4.5.1 Achieving biodiversity gains

There are three main approaches to achieving biodiversity gains at an offset site:

- Enhancement of an existing habitat to improve its condition (biodiversity gain);
- Creation of habitat through new plantings (biodiversity gain); and
- Preventing loss of the otherwise inevitable destruction of habitat (averting biodiversity loss).

Enhancement of an existing habitat

Enhancement of an existing habitat to improve its condition by reversing a declining trend may include activities such as weed and pest control or fencing out stock or other pests. Enhancing existing habitat is an attractive proposition because of the general ecological principle that restoration actions are more likely to be successful in existing habitats. In other words, it is easier to improve degraded natural habitats than to create new habitat where it previously didn't exist.

In some cases, evidence exists to inform the management actions necessary to achieve stated biodiversity gains. For example, there is evidence to support that

reducing possum residual trap catch indices below 5% will reverse forest canopy decline and improve and maintain its health.

However, the drawback to enhancement as a way of achieving biodiversity gains is that while it may lead to 'no net loss' in biodiversity through improving the quality of habitat, the area of total habitat will be reduced because the activity at the impact site will destroy an area of habitat, but the conservation actions at the offset site will not create new habitat. It can also be difficult to predict biodiversity gains when good data is not available. This can be minimised by combining enhancement activities with habitat creation, where possible.

Habitat creation

Creation of habitat typically involves restoration plantings of species that form the early stages in a succession towards a desired final habitat. For example, restoration may involve planting fast-growing species that can act as a nursery for slower-growing species to emerge.

In contrast to enhancing existing habitats, creating new habitats increases (or at least balances-out losses in) the total area of a habitat. However, the success, and the ecological trajectory, of restoration plantings can be difficult to predict. Restoration planting often has variable success, sometimes due to poor maintenance, and plants exhibit variable growth rates around the country depending on such factors as soil fertility, amount of rainfall, temperature, proximity to the coast and species used. It may also take a very long time before biodiversity gains are realised.

Preventing loss

Preventing loss, also known as averted loss, is the removal of a threat to a habitat where there is reasonable and credible evidence that the threat will be realised, resulting in destruction of biodiversity. To be defensible, averted loss offsets must show that any on-going or impending threats are either operating or are highly likely to occur in the imminent future (and certainly within the timeline with the project) and will have a significant impact on local biodiversity. Averted loss does not lead to 'no net loss' in biodiversity compared to what currently exists, but only in terms of what is likely to exist in the future, in the absence of the offset activity. However, averted loss offsets can still be good practice if they meet the principle of additionality, described in Section 8.5.

4.5.2 Similarity and equivalence of biodiversity being exchanged

Exchanging one component of biodiversity for another

Because many biodiversity offsetting currencies are dependent on categorising and exchanging biodiversity, there is a risk that the good practice definition of no net loss will not be achieved unless exchange restrictions are built into the calculations. For example, in the absence of exchange restrictions, area x condition currencies may allow for bird or tree species to be substituted for each other, including high-value species. Currencies may also allow different age classes to be exchanged (e.g. breeding adults versus juveniles, beech saplings for mature beech trees).

It is *good practice* to apply restrictions to biodiversity exchanges to ensure that the good practice definition of no net loss can be achieved.

Exchanging area for condition

Management actions designed to achieve no net loss may focus on improving the condition of biodiversity through activities such as pest control, through creating new habitat or through averting loss.

Offsets often combine more than one approach to achieving biodiversity gains, such as applying legal protection to a vulnerable site, removing pests, fencing-off the area and, potentially, restoration plantings in areas adjacent to existing habitat.

The exact combination of management measures should be decided on a case-by-case basis. In some circumstances, the patterns within the landscape may be seen as more important (suggesting a focus on maintaining or increasing area to maintain connectivity) and, in other cases, the enhancement of a species, habitat, or ecosystem may be deemed to be more valuable (suggesting a focus on increasing condition).

While some flexibility is necessary, there may be a need to place some constraints (e.g. via exchange restrictions) around how much loss of area can be traded off for gain in condition. This is because loss of area can have consequences for how species move through the landscape (see Section 8.4.3), how well ecosystem processes continue to function and remain connected, and how conservation priorities are achieved. It can also reduce future biodiversity management opportunities.

Examples of possible restrictions on exchanging loss of area for gain in condition include:

- Environments that have already been severely reduced in extent should not be reduced further in extent. Rather, they should be replaced with the same or greater area than is lost (noting that some environments that have been severely reduced in extent may need to be avoided altogether; see Section 6 on Limits to offsetting); and.
- Loss of large areas of moderate- to high-condition biodiversity may not be appropriate to trade for improvements in condition of low-value, low-condition biodiversity.

It is *good practice* to apply exchange restrictions to protect against the undesirable consequences of losing area in exchange for gaining condition.

4.5.3 Biodiversity in the landscape

Landscape context is a BBOP Principle.

The size and location of the offset site (or sites) and the management activities designed to achieve no net loss should take into account a much broader biodiversity context than focussing solely on demonstrating no net loss for individual components of biodiversity. This is because long-term viability of biodiversity at any given site critically depends on its interaction with other components of the wider landscape. This is referred to by BBOP as the landscape context.

Some of the reasons why this is important are:

- **Connectivity**. A species' feeding, mating, colonising or dispersal behaviour might require habitats to be connected. Restoration of an isolated site may not address a species' overall ecological requirements;

- **Proximity**. In general, nearby impact and offset sites are more likely to contain similar biodiversity features (e.g. in the same ecological district, catchment or other natural boundary[17]);
- **Ecosystem function**. It may not be possible to achieve no net loss at an ecosystem level if individual components, which normally all occur within the same site, are offset at a number of different sites, or if the choice of site is too small;
- **Local importance**. Conservation priorities can be locally or regionally specific. For example, a plant community may not be nationally rare but may be locally rare (e.g. because it only occurs at one site in the local area). This would make it important to replace locally; and
- **Future proofing.** The offset site should consider biodiversity aspirations and objectives for the area and future likely developments and emerging threats.

It is *good practice* to:

- Evaluate a wide range of candidate offset sites to achieve the best outcome; and
- Make the most of conservation and landscape planning tools. For example, satellite images, aerial imagery, GIS, national maps and databases, spatial prioritisation software, data on ecosystem condition and long-term monitoring reports.

4.5.4 Managing risk of failure and uncertainty of outcome

Management actions necessary to achieve no net loss are usually based on predictions of anticipated gains. This introduces a level of risk of failure and uncertainty about whether future gains can be delivered or will resemble that anticipated by the predictions. This section deals with tools for managing risk of failure and uncertainty of outcome during the accounting process.

Uncertainty of biodiversity gains (and losses)

Uncertain outcomes result from the fact that biodiversity is complex and difficult to measure. It is also difficult to predict ecological responses anticipated to occur with or without management actions, and because biodiversity trajectories vary substantially over time. These uncertainties are often compounded when combined in an offset calculation.

It is *good practice* to:

- Attempt to quantify the degree of error and uncertainty for a particular currency;
- Use rigorous assessments of impacts and offset success in the currency and also test a precautionary approach (e.g. determine the greatest plausible losses and smallest plausible gains) to see if this will still achieve no net loss;
- Apply a systematic and independent assessment of benchmark (reference) sites and condition to calibrate measures of loss and gain and use different benchmarks to assess changes to different components of biodiversity, where appropriate; and
- Provide stakeholders with an opportunity to understand and provide feedback on the parameters and the model(s) used to estimate no net loss.

[17] There are, however, instances where the best biodiversity gains are made at a remote site. For example, pest control at a remote breeding location of a bird whose feeding habitat is affected by development elsewhere.

Time lag between impact and offset activities

Impacts usually occur before offset activities are implemented, meaning that there is a time lag between when biodiversity is lost and when biodiversity gains are fully delivered. Time lags can have unanticipated ecological consequences, such as the permanent loss of a population due to long-term loss of critical habitat features (e.g. bat roost trees), isolation from other populations (e.g. fragmentation of *Powelliphanta* snail or lizard populations), reduced food supply, through direct mortality threatening population viability or through loss of pollination or dispersal mechanisms.

Other examples include:

- Breeding habitats that need to be restored prior to the arrival of migratory species that would otherwise abandon that site.
- Fish passage that needs to be restored before whitebait season.
- The size of a population or age to maturity may dictate how quickly targets need to be achieved to avoid loss of genetic diversity.

It is *good practice* to:

- Identify biodiversity that could be at risk of further decline due to time-lags; and
- Where possible, achieve biodiversity gains prior to development impacts.

Unexpected environmental conditions

Offset sites can suffer catastrophic failures due to such things as a particularly dry or windy summer, floods, slips or fire.

It is *good practice* to:

- Minimise catastrophic loss through a broader and longer-term risk assessment on appropriate site selection and hazard management during development and offset implementation.
- Select a larger and more varied portfolio of offset sites and activities.

Untested, unsound or poorly implemented techniques

The section on limits to offsetting explains that it is *good practice* to demonstrate that offset activities will achieve the desired outcomes, particularly for highly valued biodiversity. However, there are practical measures that can be taken to minimise risk of failure on the ground that should be considered in all cases.

It is *good practice* to:

- Use only tested management methodologies that work and seek expert assessment and peer review of offset activity proposals;
- Ensure that the applicant or contractor has sufficient skills and experience to successfully carry out the offsetting activities;
- Use appropriate and justifiable multipliers to address specific risks (e.g. if a 50% maturation success rate is likely, at least double the number of seedlings planted); and
- Where generic multipliers and discount rates are used to address risk or uncertainty, understand and justify their use as a risk management strategy.

Other sources or risk and uncertainty

Risk and uncertainty need to be managed throughout the offsetting process and advice on how to do this is provided in other sections of the Guidance; for example, through:

- Adhering to good practice on limits to offsetting;
- Investing in an appropriate level of data collection when measuring impacts;
- Using multiple and complementary biodiversity offset currencies, or attributes representing multiple components and types; and
- Ensuring that monitoring procedures are in place (see Section 9).

4.5.5 Stakeholder equity

Equity is a BBOP Principle.

Biodiversity, habitats and ecosystems are valued by people for many reasons, including cultural value, existence value (so called 'intrinsic' value), recreational use and enjoyment, freshwater, erosion control, food, relaxation and health benefits.

Removal of biodiversity values which will not be replaced for long periods of time, or that may be replaced in a different location, means that people may be losing those values and may want this addressed as part of the offset proposal. An applicant should reasonably respond to this expectation, to meet the BBOP principle of equity.

Equity across time

Economists have approached the social equity problem of losing biodiversity before it is gained by drawing an analogy to money. For example, people are generally willing to forego spending today if they will receive back more money in the future, such as through an interest rate on their savings. This concept has been used in biodiversity offsetting calculations to require that a greater amount of biodiversity is gained in the future than was previously lost.

Applying such an 'interest rate'[18] to the amount of biodiversity that is being lost has the advantage that it can be incorporated directly into offsetting calculations. However, selecting an appropriate interest rate is not easy because it is difficult to determine how much extra biodiversity people would accept in the future to compensate for the loss of biodiversity now. Furthermore, people may not value biodiversity in the same way that they value money. Changing the interest rate by even a relatively small amount can also result in disproportionately large changes to the size of the required offset.

An interest rate of between 1% and 4% has sometimes been applied in New Zealand[19] to address social equity (this range of values does not include uncertainty which is also sometimes addressed through a discount rate—see Section 7) and could be a useful starting point to address social equity unless a more appropriate rate can be determined in consultation with affected stakeholders.

Equity over a very long timeframe should also be addressed, as anything longer than one generation could be considered to be a permanent loss in human terms. Very long timeframes to achieve no net loss also create difficulties of ensuring consistent management and maintaining the purpose of the management. A period commensurate with the expected term of a resource consent is recommended as good practice to address social equity issues.

---

[18] This is commonly referred to in offsetting calculations as a discount rate, because people 'discount' the value of future benefits compared with benefits that they can obtain today.

[19] Pers. comm. Cross Departmental Research Programme (CDRP) Ecologists Working Group.

However, other approaches that do not set an outside time limit on achieving no net loss may also be acceptable and could be determined in consultation with stakeholders.

Equity across space

Depending on the circumstance, cultural and use values of biodiversity may only be meaningful across a limited spatial extent. For example, use values might require maintaining minimum river flows, ensuring fish passage for whitebait, retaining wetlands to reduce flood duration and retaining soil on hill slopes. Stakeholders should therefore be consulted on whether proposed offsite sites are able to deliver such values in an equitable manner.

In summary it is *good practice* to address stakeholder equity issues through:

- Describing how equity issues relating to time lag will be addressed;
- When proposing a discount rate, providing justification for the rate, discussing it with stakeholders and understanding the implications for the offset calculations;
- Achieving no net loss within the expected term of a resource consent, unless an alternative approach can be determined in consultation with stakeholders; and
- Ensuring that impact and offset sites are sufficiently close together and provide equitable outcomes relating to cultural and use values.

4.6 Demonstrating additionality

Additional conservation outcomes is a BBOP Principle.

BBOP Principle 5 states that a biodiversity offset should achieve conservation outcomes above and beyond results that would have occurred if the offset had not taken place. This is because conservation actions already planned and funded, in place, or required by law do not deliver any extra biodiversity gains to balance biodiversity lost at an impact site. Without additional conservation actions demonstrated at point of design, it is not possible to achieve a no net loss outcome. This aspect of the process is called ‘additionality’.

The applicant must be able to show that *but for the intention to deliver it as an offset*, they would not have invested in it or undertaken the management actions. This can be achieved by comparing how the biodiversity components are predicted to change under the status quo scenario with how they would change under the offset scenario.

Some factors to consider include:

- Whether an applicant invests in land and/or conservation management actions for the express purpose of offsetting a clearly defined and quantified development impact (e.g. creating a covenant and/or pest control);
- District and Regional Plan Rules. Some District Plans have rules to prevent the clearance of indigenous vegetation for the lifetime of the Plan provision, thus legal protection, such as a covenant, *may not* confer *additional* protection over the vegetation if it is already subject to a strong protecting mechanism; and
- Management already occurring at the site(s). An area may already be subject to active management to control possums (e.g. for TB control), so pest control would need to be greater in scope than just possum control for it to be considered additional (e.g. adding rat and stoat control).

In cases where improvements in biodiversity are attained prior to an impact occurring, it is especially important that additionality has been demonstrated and documented *at the time*[20]. Mechanisms that could be used to demonstrate the intent of conservation actions to offset a future development impact include:

- Statutory declarations of intent;
- MOUs;
- Consent notices (s.221); or
- An analogous concept to one of the following existing mechanisms:
  - A certificate of compliance
  - A covenant or other title restriction
  - A form of works verification developed by Local Government New Zealand
  - A formal registration process with an agency willing to assume recording responsibility

Table 1 provides some examples of management actions, including whether or not they would be considered additional.

Guarding against leakage

The BBOP Principle on additionality also states that offset design and implementation should avoid displacing activities harmful to biodiversity to other locations. This is known as leakage.

For example, driving goats from an offset site into neighbouring forest reduces goat browsing at one location and may achieve the offset, but increases browsing on the adjoining site. This does not result in biodiversity gain because the overall amount of damage remains the same.

Measures to address leakage are highly specific to the biodiversity offset under consideration.

It is *good practice* to:

- Provide evidence that the conservation gains at the offset sites(s) are a direct result of the proposed offset and will persist over a timeframe necessary to deliver no net loss; and
- Demonstrate that a risk assessment has been conducted and that there is no risk of highly consequential leakage and that there are reliable provisions for managing any leakage during implementation.

[20] Summary report measuring impacts and defining biodiversity offset specifications for the Tahi NZ Eco-resort. Dr Neil Mitchell and Bingqin Xu. School of Environment, The University of Auckland. 2011.

Table 1: Examples of actions potentially producing biodiversity gain that may or may not also achieve additionality.

Investment or management action undertaken	Considered Additional?	How to achieve biodiversity gain	Document additionality
Legal protection of an area that would definitely and imminently be, or is being, cleared or severely modified by human actions, e.g. the forfeiting of an economically viable and imminent development right (averted loss offset).	**Yes**	Protect the area in perpetuity with an appropriate binding legal mechanism before impact occurs. Apply appropriate management to remove remaining threatening processes if necessary for no net loss and monitor effectiveness.	On legal protection document include purpose of protection (e.g. biodiversity offset). Provide compelling evidence that area would definitely and imminently be lost without the offset. Record the level of additional management (e.g. type, area (ha) and cost of pest control) undertaken. Measure and report the improvement in biodiversity values.
Legal protection of an area that cannot be cleared or modified under District Plan or Regional Plan rules and is currently not at risk from other threatening processes (proposed averted loss offset).	**No** The area is already protected under the rules and no threats exist that could be averted.	N/A	N/A
Legal protection of biodiversity subject to protective District Plan or Regional Plan rules but the plans allow for existing use rights (e.g. stock grazing) or other threatening processes exist (proposed averted loss offset).	**Yes** As long as threatening processes are occurring or reasonably expected to occur in the short term.	Apply appropriate management to remove threatening processes and monitor effectiveness.	On legal protection document include purpose of protection (e.g. biodiversity offset). Provide compelling evidence that area would definitely and imminently be lost without the offset. Record the level additional management (e.g. type, area (ha) and cost of pest control) undertaken. Measure and report the improvement in biodiversity values.
Undertake pest management in an area where no such previous management has occurred (or has lapsed) (biodiversity gain).	**Yes**	Undertake target based pest management using tested and proven methods.	Record the level of pest control (type, area (ha) and cost) undertaken. Measure and report the improvement in biodiversity values.

Investment or management action undertaken	Considered Additional?	How to achieve biodiversity gain	Document additionality
Undertake management actions on land administered by the Department of Conservation (DOC), or another agency, where relevant threatening processes are occurring and can be alleviated.	**Yes** As long as stakeholder engagement occurs with the agency administering the land and it is agreed that the relevant threats at the proposed offset site are not being managed and that no plans for their management exist. The location of the offset and detail of management activities needs to be agreed with the relevant agency.	Agree management targets and apply appropriate management to remove threatening processes. Monitor effectiveness.	Measure, monitor and report state of original biodiversity and ongoing improvements. Adaptively respond where monitoring of management outcomes indicates prior agreed targets are not met.
Undertake management actions on land administered by the Department of Conservation (DOC), or another agency, where threatening processes are occurring and are either managed or planned to be managed by DOC or another party.	**No** The threats are already under management or management is planned but not yet implemented.	Locate another area where relevant threatening processes are occurring and their management is not occurring or planned to occur. On agreement of offset with landowner /administrator, apply appropriate management to remove threatening processes. Monitor effectiveness.	Measure, monitor and report state of original biodiversity and ongoing improvements. Adaptively respond where monitoring of management outcomes indicates prior agreed targets are not met.
Take over the management or funding of an existing and operationally secure pest management programme (attempted biodiversity gain).	**No** There is no additional benefit to biodiversity as the status quo is maintained.	Additionality may be obtained by increasing the scope or area over which the pest management takes place.	Record the level of pest control (type, area (ha) and cost) originally undertaken and the additional scope or area over which it is applied. Measure and report the improvement in biodiversity values.
Fencing an area where stock incursion is the main cause of reducing biodiversity values (biodiversity gain).	**Yes**	Use appropriate fence type for scenario, preferably permanent fence.	Measure and record the improvement of understory condition and the amount of fencing undertaken.
Fencing an area that is subject to stock incursions, but also contains a lot of goats or deer. (attempted biodiversity gain).	**No** Access by goats or deer not prevented by fence and will prevent improvement in biodiversity condition.	May be considered additional if effective goat or deer control or eradication also undertaken.	Measure and record the improvement of understory condition, the amount of fencing and the frequency, effectiveness and area of goat or deer control.

Investment or management action undertaken	Considered Additional?	How to achieve biodiversity gain	Document additionality
Successfully rehabilitate an ecosystem (e.g. revegetation to establish a forest, removal of weeds and re-mobilisation of dunes, weed removal and increasing water table in wetland system) (biodiversity gain).	**Yes**	Undertake management using tested and proven methods and protect in perpetuity with a legal mechanism.	On legal protection document include purpose of protection (e.g. biodiversity offset). Record the management actions (type, area (ha) and cost) undertaken. Measure and report the improvement in biodiversity values.

5. Offset implementation and monitoring

Achieving long-term outcomes is a BBOP Principle.

Experience globally shows that failure to implement promised and necessary biodiversity offset conservation measures is one of the greatest causes of failure to achieve no net loss offsetting, regardless of how well the offset proposal is designed.

For biodiversity offsetting to be accepted as an effective means of addressing residual adverse effects, there must be some form of assurance that the biodiversity gains at the offset site will be realised. Offset sites must therefore be monitored, requirements must be appropriately specified and enforced and funding must be ensured for the lifetime of the offset.

Achieving all of this requires buy-in, commitment and resources from both the developer and the regulator. Typically, a formalised biodiversity offset / no net loss approach requires greater resource, consistency, and rigour to quantify and validate intended conservation outcomes and no net loss than other less outcome-focused biodiversity commitments.

The two key components of achieving long term outcomes are:

- Biodiversity offset management plans (BOMPs); and
- Monitoring and compliance regimes.

5.1 Biodiversity Offset Management Plans (BOMPs)

A Biodiversity Offset Management Plan (often referred to in New Zealand as an Environmental Management Plan) outlines the impacts, the proposed offset (including how these were calculated or arrived at) and how to adaptively manage and monitor progress to ensure that no net loss is achieved over the long term. In doing this, the BOMP can help inform the development of consent conditions consistent with its objective and detail.

Developing a BOMP reduces risk of offset failure by assisting project managers in the organisation and implementation of the activities necessary to achieve offset objectives. This is important because the people implementing an offset may not be those who developed it.

Thus, it is critical that a BOMP clearly states the offset's no net loss goal and states and describes the associated objectives (e.g. management targets, such as residual trap catch indices or area of vegetation community type canopy cover and condition) and methods to achieve objectives as well as details of monitoring so that the path to no net loss can be effectively managed. It is also important to avoid confusion by separating any other environmental management activities that are not part of the offset (e.g. amenity planting and wetlands constructed for stormwater treatment) from the BOMP.

When developing a BOMP it is useful to address the following questions:

- What are the offsetting activities, how do they link to impacts and where will they be carried out?
- How will the offset operate and be managed?
- Who is responsible for the range of management actions and what are the timeframes for their implementation?
- How will the offset be financed over the long term (legal, institutional and financial aspects)?
- How will the offset be adaptively monitored?
- What are the risk and adaptive management considerations? (e.g. what are the triggers for adaptive responses, how will they be monitored and who is responsible for monitoring them?

In most offsets, newly created habitat (e.g. restoration plantings) will initially support a smaller range of species and biodiversity values compared with the more mature system that was lost. Similarly, undertaking pest control or fencing will not result in immediate improvements sufficient to achieve no net loss because gains accrue over time as biodiversity responds to release from pest pressure. The progress of the biodiversity gain needs to be monitored against the predicted gain, and management adjusted to ensure that all targets are achieved and, preferably, exceeded.

Biodiversity offsets need to endure for the length of time over which biodiversity is lost. Due to the pervasive effects of pests on biodiversity in New Zealand, once no net loss has been achieved, ongoing management will often be needed to ensure that biodiversity gains are maintained over the long term. Therefore, management required for offsets should, at a minimum, be continued for the duration of the impact of the development, which may be longer than the life of the consent and could potentially be required in perpetuity (e.g. biodiversity loss for highway construction).

Management will be more straightforward for the life of the impact, where the same landowner or land-manager is responsible for the site. This will likely be the case for more permanent structures (such as dams or roads) where responsibility is tied to a resource consent. In other cases, the management passes out of the hands of the developer very quickly (e.g. subdivisions) and it can be difficult to encourage the new landowner(s) to continue management. Some rules can be applied to help secure ecological permanence if they are legally binding and if resources are available to ensure compliance, such as residents of subdivisions being prohibited (e.g. by covenants on their title) from having predatory pets or from planting weedy plant species.

It is *good practice* to develop and submit with a resource consent application a BOMP effectively communicating objectives and methods, key roles and responsibilities, adaptive management and monitoring processes and provisions for stakeholder participation.

More information on biodiversity offset management plans is provided in the Biodiversity Offset Management Plans document.

5.2 Monitoring and compliance regimes

5.2.1 Good practice monitoring under the RMA

At present, the majority of biodiversity offsetting proposals in New Zealand are in relation to development proposals under the RMA. Although the RMA includes a number of statutory tools to support an effective and efficient consent monitoring and compliance process, for various reasons, councils may not always make use of the full suite of tools available to them. As a result, sometimes council consent monitoring functions are simply not undertaken, or fail to meet their intended objective[1]

However, no net loss will only be achieved if measures designed to achieve them are effectively implemented and are successful in achieving their stated outcomes. Ongoing monitoring of proposed implementation measures (including their effectiveness) and an assessment (and, where necessary, enforcement) of compliance with them are, therefore, key components of a good practice biodiversity offset. Planning for monitoring, including setting thresholds, and adaptive responses can occur during the development of the BOMP and can assist the development of consent conditions. Adequate consent conditions, monitoring and compliance are critical to the successful design, and implementation of a biodiversity offset[21].

[1] Brown, M.A.; Clarkson, B.D.; Barton, B.J.; Chaitanya, J. 2013. Ecological compensation: an evaluation of regulatory compliance in New Zealand. *Impact Assessment and Project Appraisal 31(1)*: 34–44.

It is *good practice* to:

- However, no net loss will only be achieved if measures designed to achieve them are effectively implemented and are successful in achieving their stated outcomes. Ongoing monitoring of proposed implementation measures (including their effectiveness) and an assessment (and, where necessary, enforcement) of compliance with them are, therefore, key components of a good practice biodiversity offset. Planning for monitoring, including setting thresholds, and adaptive responses can occur during the development of the BOMP and can assist the development of consent conditions. Adequate consent conditions, monitoring and compliance are critical to the successful design, and implementation of a biodiversity offset[21].
- Provide resources so that appropriate expertise is available to assess applications and develop appropriate consent conditions (including requiring third party verification by specialists where appropriate);
- Ensure that monitoring requirements, thresholds, triggers and adaptive responses are enforceable and explicitly provided for in consent conditions and with sufficient detail to achieve the desired outcome;
- Regularly audit the performance of an offset against required outcomes, including independent verification that specified management actions have been taken; and
- Use RMA provisions (s128) to require their review where monitoring provides evidence that they are failing to deliver no net loss outcomes.

Specifying comprehensive consent conditions increases the likelihood that measures designed to achieve no net loss offsets will be effectively implemented.

The Quality Planning (QP) website has comprehensive guidance on best practise for consent conditions (http://www.qualityplanning.org.nz/index.php/consents/conditions). In addition, consider specifying consent conditions that:

- Require the holder to prepare a BOMP (or similar) and to exercise the consent in accordance with that plan; and
- Use consent notices to ensure that a piece of land is managed appropriately on a continuing basis; for example, through the Reserves Act 1977 or the Queen Elizabeth the Second National Trust Act 1977.

Effective monitoring is also vital for ensuring that long-term biodiversity outcomes are achieved. The QP website has guidance on best practice for monitoring of resource consents (http://www.qualityplanning.org.nz/index.php/monitor/resource-consents-and-compliance). In addition, consider tailoring monitoring to the specific site where the offset will be made, rather than duplicating a previous biodiversity monitoring programme.

5.2.2 Good practice monitoring under the CMA

Generally, a mining development authorised by an access arrangement under the CMA will also require a resource consent under the RMA. Accordingly, there are parallels between good practice monitoring under the RMA and CMA. As such, where a mining development is to be located on public conservation land and a biodiversity offset is proposed, it is advisable to engage with DOC at an early stage in the consenting process, as there are benefits in obtaining an access arrangement (and any necessary approvals for the biodiversity offset), prior to obtaining resource consents.

An advantage of this approach is that councils could then have regard to the access arrangement when setting their own resource consent conditions, thereby avoiding potential inconsistencies in conditions or unnecessary duplication of monitoring or compliance requirements. Obtaining the access arrangement first provides greater certainty on biodiversity issues for councils, as it enables them to consider the actual offsetting conditions and requirements required by DOC through the access arrangement, including how DOC

proposes to monitor performance, and the safeguards in place against non-compliance. These safeguards are likely to include bonds or other financial instruments, as good practice requires assurance that the financial means to deliver on biodiversity obligations are in place.

However, there may be times when the advantages of obtaining an access arrangement prior to a resource consent are outweighed by other considerations associated with the mining proposal; for example, the commitment of resources and the time required for regulatory approval. In such cases, safeguards necessary to achieve long-term outcomes will need to be achieved through a combination of resource consent conditions and access arrangements.

6. Bibliography

The following sources of information informed the thinking and development of the Guidance on Good Practice Biodiversity Offsetting in New Zealand and associated technical support documents.

Anon 2000. The New Zealand Biodiversity Strategy. Ministry for the Environment, Wellington. http://www.biodiversity.govt.nz/picture/doing/nzbs/Index.html

BBOP 2009a. Business and Biodiversity Offsets Programme (BBOP) 2009. Resource paper: Biodiversity offset cost-benefit handbook. BBOP, Washington, D.C. http://bbop.forest-trends.org/pages/guidelines

BBOP 2009b. Business and Biodiversity Offsets Programme (BBOP) 2009. Resource paper: Biodiversity offset design handbook. BBOP, Washington, D.C. http://bbop.forest-trends.org/pages/guidelines

BBOP 2009c. Biodiversity offset implementation handbook. BBOP, Washington, D.C. http://www.forest-trends.org/documents/files/doc_3092.pdf

BBOP 2012a. Business and Biodiversity Offsets Programme (BBOP) 2012. Resource paper: No net loss and loss-gain calculations in biodiversity offsets. BBOP, Washington, D.C. http://bbop.forest-trends.org/pages/guidelines

BBOP 2012b. Business and Biodiversity Offsets Programme (BBOP) 2012. Resource paper: Limits to what can be offset. BBOP, Washington, D.C. http://bbop.forest-trends.org/pages/guidelines

BBOP 2012c. Standard on biodiversity offsets. BBOP, Washington, D.C. http://bbop.forest-trends.org/pages/guidelines

BBOP 2013. To No Net Loss and Beyond: An Overview of the Business and Biodiversity Offsets Programme. BBOP, Washington, D.C. http://bbop.forest-trends.org/pages/guidelines

Bekessy, S.A.; Wintle, B.A.; Lindenmayer, B.D.; McCarthy, M.A.; Colyvan, M.; Burgman, M.A.; Possingham, H.P. 2010. The biodiversity bank cannot be a lending bank. *Conservation Letters 3*: 151–158.

Brown, M.A. 2010. Experiences and learnings from environmental compensation arrangements on conservation and private land. Contract report prepared for New Zealand Biodiversity Offsets Programme, September, 2010. New Zealand Department of Conservation, Wellington.

Brown, M.A.; Clarkson, B.D.; Stephens, R.T.T.; Barton, B. 2014. Compensating for ecological harm—the state of play in New Zealand. *New Zealand Journal of Ecology 38(1)*: 139–146.

Brown, M.A.; Leathwick, J. 2013. Evaluation of the Robust Offsets Calculator ("RobOff") for designing biodiversity offsets in New Zealand. Contract report prepared for New Zealand Biodiversity Offsets Programme, August 2011. New Zealand Department of Conservation, Wellington.

Denne, T; Bond-Smith, S. 2011. Discounting for biodiversity offsets. Contract report prepared for New Zealand Biodiversity Offsets Programme, May 2011. Covec Ltd, New Zealand.

Department of Environmental Affairs and Development Planning 2007. Provincial guideline on biodiversity offsets. Department of Environmental Affairs and Development Planning, Provincial Government of the Western Cape, Cape Town, Republic of South Africa.

Gardner, T.A. 2010. Monitoring forest biodiversity: improving conservation through ecologically responsible management. Earthscan, London.

Gardner, T.; von Hase, A. 2012. Key ingredients for biodiversity offsets to achieve no net loss. Contract report prepared for New Zealand Biodiversity Offsets Programme, Department of Conservation, New Zealand.

Gardner, T.A.; von Hase, A.; Brownlie, S.; Ekstrom, J.M.M.; Pilgrim, J.D.; Savy, C.E.; Stephens, R.T.T.; Treweek, J.; Ussher, G.T.; Ward, G.; ten Kate, K. 2013. Biodiversity offsets and the challenge of achieving no net loss. *Conservation Biology. published online: 23 AUG 2013. DOI: 10.1111/cobi.12118*

Gibbons, P.; Briggs, S.; Ayers, D.; Seddon, J.; Doyle, S.; Cosier, P.; McElhinny, C.; Pelly, V.; Roberts, K. 2009. An operational method to assess impacts of land clearing on terrestrial biodiversity. *Ecological Indicators 9*: 26–40.

Gibbons, P; Lindenmayer, D.B. 2007. Offsets for land clearing: no net loss or the tail wagging the dog. *Ecological Management and Restoration 8(1)*: 26–31.

Gillespie, A. 2012. A missing piece of the puzzle: biodiversity offsets. Contract report prepared for New Zealand Biodiversity Offsets Programme, New Zealand Department of Conservation.

Kuhnert, P.M.; Martin, T. G.; Griffiths, S.P. 2010. A guide to eliciting and using expert knowledge in Bayesian ecological models. *Ecology Letters 13*: 900–914.

Lee, W.; McGlone, M.; Wright, E. 2005. Biodiversity inventory and monitoring: a review of national and international systems and a proposed framework for future biodiversity monitoring by the Department of Conservation. Landcare Research Contract Report LC0405/122 prepared for the New Zealand Department of Conservation.

MacMillan, D.C; Marshall, K. 2006. The Delphi process—an expert-based process to ecological modelling in data-poor environments. *Animal Conservation 9*: 11–19.

Margules, C.R.; Pressey, R. L. 2000. Systematic conservation planning. *Nature 405*: 243–253.

Maron, M.; Hobbs, R.J.; Moilanen, A.; Matthews, J.W.; Christie, K.; Gardner, T.A.; Keith, D.A.; Lindenmayer, D.B.; McAlpine, C.A. 2012, Faustian bargains? Restoration realities in the context of biodiversity offset policies. *Biological Conservation 155*: 141–148.

Maron, M.; Rhodes, J.R.; Gibbons, P. 2013. Calculating the benefit of conservation actions. *Conservation Letters 6(5)*: 359–367.

McBride, M.F.; Fidler, F.; Burgman, M.A. 2012. Evaluating the accuracy and calibration of expert predictions under uncertainty: predicting the outcomes of ecological research. *Diversity and Distributions 18*: 782–794.

McCarthy, M.A.; Parris, K.M.; Van Der Ree, R.; McDonnell, M.J.; Burgman, M.A.; Williams, N.S.G.; McLean, N.; Harper, M.J.; Meyer, R.; Hahs, A.; Coates, T. 2004. The habitat hectares approach to vegetation assessment: an evaluation and suggestions for improvement. *Ecological Management Restoration 5*: 24–27.

Moilanen, A.; van Treeffelen, A.J.A.; Ben-Haim, Y.; Ferrier, S. 2009. How much compensation is enough? A framework for incorporating uncertainty and time discounting when calculating offset ratios for impacted habitat. *Restoration Ecology 17(4)*: 470–478.

Noss, R.F. 2004. Some suggestions for keeping national wildlife refuges healthy and whole. *Natural Resources Journal 44*: 1093–1111.

NZBOP 2011a. Biodiversity offsetting models for the Escarpment Mine Project, Denniston Plateau, Westland. Contract report prepared by Wildland Consultants for New Zealand Biodiversity Offsets Programme, August 2011. New Zealand Department of Conservation, Wellington.

NZBOP 2011b. Summary report measuring impacts and defining biodiversity offset specifications for the Tahi NZ Eco-resort. Contract report prepared by Auckland University for New Zealand Biodiversity Offsets Programme, December 2011. New Zealand Department of Conservation, Wellington.

NZBOP 2011a. Options for calculation and use of biodiversity credits generated by the Yellow-eyed Penguin Trust conservation activities. Contract report prepared by Wildland Consultants for New Zealand Biodiversity Offsets Programme, August 2011. New Zealand Department of Conservation, Wellington.

NZBOP 2011b. Biodiversity offsetting models for the Escarpment Mine Project, Denniston Plateau, Westland. Contract report prepared by Wildland Consultants for New Zealand Biodiversity Offsets Programme, August 2011. New Zealand Department of Conservation, Wellington.

NZBOP 2012a. Selection and weighting of attributes for use in biodiversity offsetting currencies. Contract report prepared by Wildland Consultants for New Zealand Biodiversity Offsets Programme, June 2012. New Zealand Department of Conservation, Wellington.

NZBOP 2012b. Offsets for developers: measuring impacts and defining offset specifications (Winstone Aggregates Symonds Hill Quarry). Contract report prepared by Wildland Consultants for New Zealand Biodiversity Offsets Programme, February 2012. New Zealand Department of Conservation, Wellington.

Overton, J.; Price, R. 2011. Ecological integrity and the design of biodiversity offsets. Landcare Research Contract report LC:800, prepared for the New Zealand Department of Conservation.

Overton, J. McC.; Stephens, R.T.T.; Ferrier, S. 2013. Net present biodiversity value and the design of biodiversity offsets. *Ambio 42(1)*: 100–10.

Parkes, D.; Newell, G.; Cheal, D. 2003. Assessing the quality of native vegetation: the 'habitat hectares' approach. *Ecological Management and Restoration 4*: S29–S38.

Pilgrim, J.D.; Brownlie, S.; Ekstrom, J.M.M.; Gardner, T.A.; von Hase, A.; ten Kate, K.; Savy, C.E.; Stephens, R.T.T.; Temple, H.J.; Treweek, J.; Ussher, G.T.; Ward, G. 2013. A framework for assessing offsetability of biodiversity impacts. *Conservation Letters 6(5)*: 376–384.

Pouzols, F.M.; Burgman, M.A.; Moilanen, A. 2012. Methods for allocation of habitat management, maintenance, restoration and offsetting, when conservation actions have uncertain consequences. *Biological Conservation 153*: 41–50.

Roper-Lindsay, J.; Christensen, M. 2010. A framework for biodiversity offsets in New Zealand. Contract report prepared for New Zealand Biodiversity Offsets Programme, November 2010. New Zealand Department of Conservation, Wellington.

Salzman, J.; Ruhl, J.B. 2000. Currencies and the commodification of environmental law. *Stanford Law Review 53*: 607–694.

Speirs-Bridge, A.; Fidler, F.; McBride, M.; Flander, L.; Cumming, G.; Burgman, M. 2010. Reducing overconfidence in the interval judgments of experts. *Risk Analysis 30(3)*: 512–523.

TBC 2011. Biodiversity offsets: appropriate limits and thresholds. Contract report prepared by The Biodiversity Consultancy Ltd., Cambridge, UK, for the New Zealand Biodiversity Offsets Programme, New Zealand Department of Conservation, Wellington.

TBC 2012. Biodiversity offsets: relative offsetability of impacts. Contract report prepared by The Biodiversity Consultancy Ltd., Cambridge, UK, for the New Zealand Biodiversity Offsets Programme, New Zealand Department of Conservation, Wellington.

Tonkin and Taylor 2012a. Barriers to no net loss biodiversity offsets. Contract report prepared for the New Zealand Biodiversity Offsets Programme, New Zealand Department of Conservation, Wellington.

Tonkin and Taylor 2012b. The role of monitoring and compliance in securing better biodiversity outcomes through offsetting arrangements. Contract report prepared for New Zealand Biodiversity Offsets Programme, New Zealand Department of Conservation, Wellington.

Walker, S.; Brower, A.L.; Stephens, R.T.; William, G.L. 2009. Why bartering biodiversity fails. *Conservation Letters 2*: 149–157.