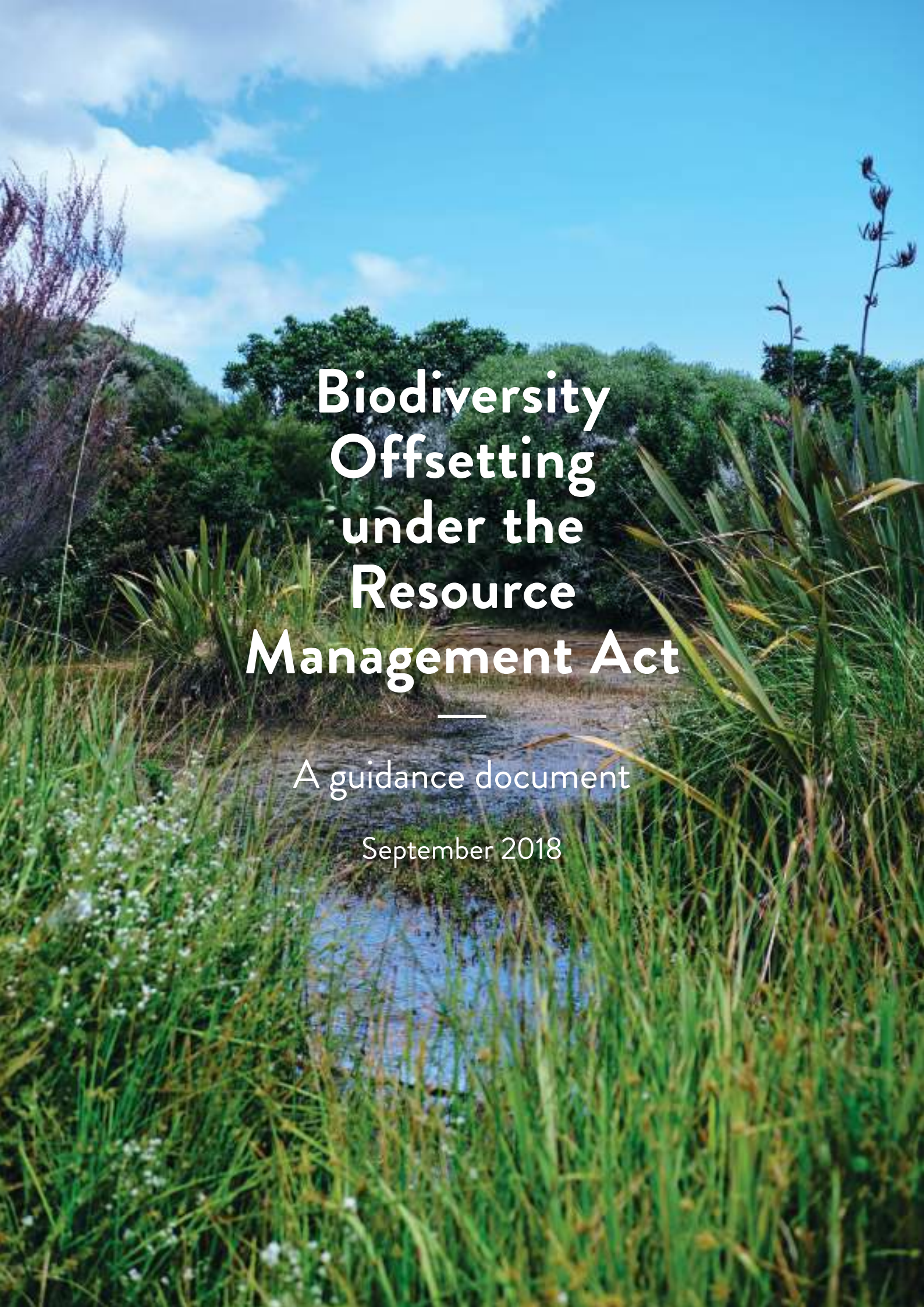

Biodiversity Offsetting under the Resource Management Act

A guidance document

September 2018

Prepared for the Biodiversity Working Group
on behalf of the BioManagers Group by

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Preface

New Zealand's indigenous biodiversity is unique. It's integral to our sense of place and identity, as well as being central to our economy. Because so much of our biodiversity is found nowhere else on earth, we are considered a global biodiversity 'hotspot'. As such, all of us have a responsibility to ensure our rich and diverse biodiversity is here for the future.

Unfortunately, our unique biodiversity is facing a range of threats, from habitat loss to impacts from introduced pest and weed species, and we are losing ground in many cases. Halting this decline will not be easy and will require urgency and new thinking.

Regional councils, with their role in biodiversity management, particularly on private land, have recently completed a think piece on biodiversity (http://www.lgnz.co.nz/our-work/our-policy-priorities/3-environment/biodiversity/) that canvasses the big issues and proposes some solutions and actions. This report makes progress on some of those actions by providing guidance on biodiversity offsetting. This is one of many important tools available to councils when considering the impact of development activities on biodiversity values.

Recent research shows that between 1996 and 2012 a total of 71,000 hectares of indigenous land cover was lost through clearance, conversion and development. Native freshwater habitats fare little better. Many tens of kilometres of streams are channelised and piped each year. These losses are not particular to any one region or land use, instead occurring across multiple jurisdictions, and resulting in biodiversity impacts throughout the country.

The majority of this development is administered by councils under the Resource Management Act, 1991 (RMA). Collectively, councils process tens of thousands of applications for resource consent each year. Part of the work of councils involves identifying appropriate options and mitigations to maintain indigenous biodiversity.

This guidance acts to support and improve the information available to council staff, land owners and resources users as they consider options around biodiversity offsetting. Applicants for resource consent must consider the ways in which their proposed activities avoid, remedy or mitigate for any adverse effects on the environment.

Since 2017, amendments to the RMA mean that councils must also consider applications that propose (or agree) to offset or compensate for any residual adverse effects on the environment.

These amendments aim to raise the bar in effects management – supporting applicants to offer up positive effects, sometimes over and above the harm caused by an activity on the environment. Biodiversity offsets aim to achieve 'no-net-loss' or a 'net gain' in biodiversity. Their use may therefore assist in slowing the decline in indigenous biodiversity.

This guidance offers best practice options for developing biodiversity offsetting proposals, providing a better understanding of both when and how offsetting should used. It represents the culmination of a two-year process to provide clearer direction to councils and consent applicants on how to understand and appropriately use biodiversity offsetting under the RMA. It has been written by a team of leading biodiversity offsetting experts with expertise spanning the legal, technical, policy and regulatory aspects of offsetting.

Our project team have drawn on the experience of central government agencies, councils, infrastructure providers, academics, ecological consultants, and others to determine the key questions people have about offsetting, and identify the steps needed to resolve them. And they have worked with the same to refine the guidance through several draft iterations.

The following document provides comprehensive guidance for councils and consent applicants grappling, day-to-day, with how to use offsetting under the RMA. Users are provided with 'how to' direction and practical recommendations on how to make offsetting work better for biodiversity conservation, from policy formulation to consent compliance.

Our hope is that this guidance will contribute to conservation efforts at a national, regional and local level. Slowing the decline in indigenous habitat cover is central to maintaining our indigenous biodiversity. We believe that biodiversity offsetting can assist us to do this, but only if it is used appropriately, following the kinds of best practice approaches outlined here.

Stephen Hall, BioManagers Convenor, **Patrick Whaley**, Biodiversity Working Group Convenor, **Jenny Fuller** and **Jamie Steer**, Project Co-Managers.

Acknowledgments

This guidance could not have been produced without the support and feedback of many people, including staff from local and central government, and input from planners, ecological consultants and researchers across the industry.

We'd specifically like to acknowledge funding and direction from the regional councils' BioManagers Group, led by Stephen Hall (Taranaki Regional Council), with project management from the Biodiversity Working Group, led by Jonathan Boow (Auckland Council) and then Patrick Whaley (Waikato Regional Council).

The project was co-led by Jenny Fuller (Auckland Council) and Jamie Steer (Greater Wellington Regional Council) with project support from James Griffin (Northland Regional Council), Ellie McNae (Environment Canterbury) and Craig Bishop (Auckland Council). James Struthers from the Greater Wellington Creative Studio designed the document.

The authors contacted a number of people in the early stages of the project and whose written or verbal views and experiences helped shape the scope of the guidance. These people included Helen Montgomery (Wairoa District Council), Alastair Lovell and Rebecca Phillips (Auckland Transport), Merrin Whatley and Scott Speed (Auckland Council), Renay Weir (Environment Canterbury), Louise Wilson (Far North District Council), and Anna Martin, Ali Caddy, Philippa Crisp, and Roger Uys (Greater Wellington Regional Council).

Others provided comments and direction on draft versions of the work. These people included Laurence Barea and Katherine Anton (Department of Conservation), Andrew Moore, Ian Stewart, Helen Sharpe and Jenna Bishop (Ministry for the Environment), Carol Bannock and Belinda Peterson (NZTA), Alastair Jewell, Carol Bergquist and Claire Webb (Auckland Council), Roger Uys, Ali Caddy, Anna Martin, Philippa Crisp and Alex McLeay (Greater Wellington Regional Council), Shay Dean (Waikato Regional Council), Alex Morgan (Environment Southland), Louise Wilson (Far North District Council), Caroline Rachlin (Upper Hutt City Council), Andrew Thomas (South Waikato District Council), Adam Forbes (Forbes Ecology), and Stephen Knight-Lenihan (University of Auckland).

Methods

This guidance was produced by a multi-disciplinary team with expertise across the science, theoretical, policy, legal, and implementation aspects of biodiversity offsetting. Their collective experience spans the commercial sector, local and central government, and academia.

Several written information sources were used to inform the guidance. These incorporated national and international material (both peer-reviewed literature and grey literature). Equally important however was the knowledge and experience of the guidance authors and the reviewers of guidance drafts.

Feedback from selected parties was invited once in the early stages of guidance development and then again on two draft versions of the document.

Using this Document

Different sections of the document will be relevant to different audiences and the document is therefore presented as chapters that collectively provide the full suite of guidance from policy to implementation, but which can stand alone (Figure 1).

A glossary of key terms and a list of recommended further reading are provided at the end of the document.

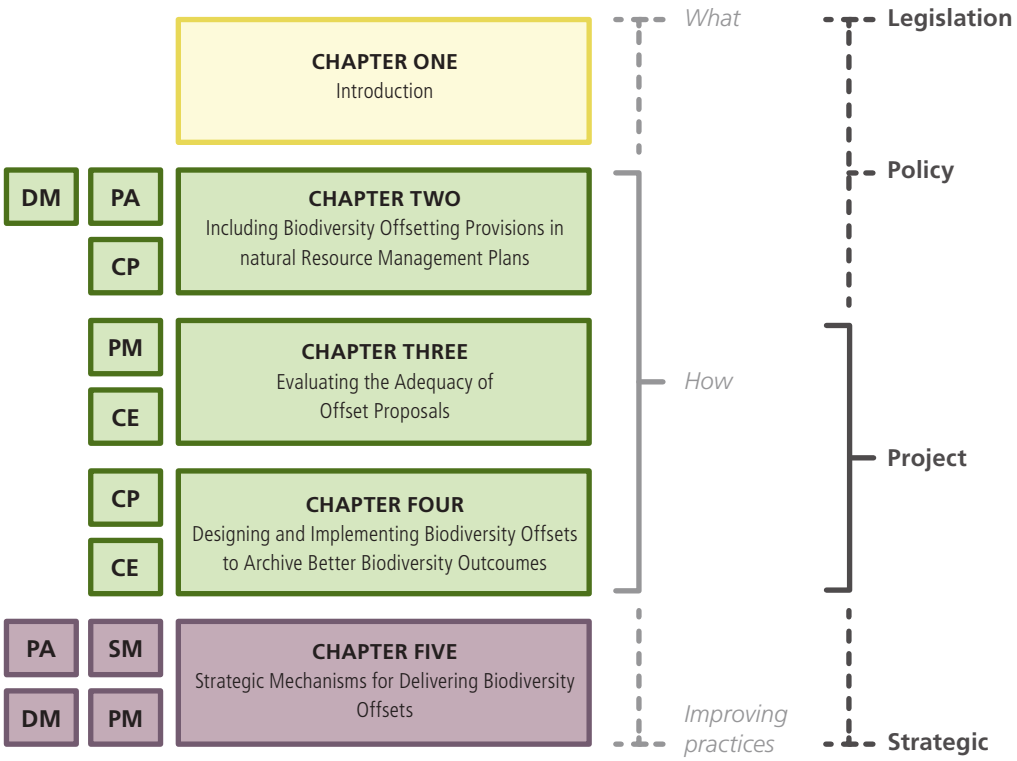


Figure 1: Document structure showing the cascade from chapters that provide the what, to the how, to recommendations for improving practices; and from high-level legislative and policy considerations to guidance for designing and implementing offsets at the project level. Chapters likely to be of most interest to various audiences are indicated: DM = Decision-Makers; PA = Policy Analysts; CP = Consent Planners; PM = Programme Managers: CE = Consultant Ecologists and Council Ecologists; SM = Strategic Programme Managers. Applicants are assumed to be represented by their consultant ecologists and consent planners; and it is assumed that Chapter One will be of general interest to all audiences.

CONTENTS

Chapter One

Introduction

This chapter provides background context to biodiversity offsetting broadly and under the Resource Management Act specifically. This chapter will be of interest to readers looking for background context.

Key Messages

- Biodiversity offsetting should only be considered after actions to avoid, remedy, or mitigate where practically feasible have been exhausted, and thus applies only to residual biodiversity impacts.
- There is a continuum of responses to effects management. The risk to biodiversity increases at each step along the effects management hierarchy from the most certain and least risky (avoidance) to the least certain and most risky (compensation).
- A no-net-loss offset is demonstrated where gains of target biodiversity generated by the offset action are of a type and amount sufficient to balance the losses of target biodiversity due to the development (no losses, no gains).
- A net-gain offset is demonstrated where gains of target biodiversity generated by the offset action are greater than the losses of target biodiversity due to the development. Thus, a net-gain offset objective is preferable to no-net-loss offset objective.
- Compensation is more likely to be subjective, unquantified, and is often arbitrary and is always the least preferable response to effects management. However, if all other options including biodiversity offsetting have been sequentially explored and exhausted or are not available, it may be appropriate to consider using environmental compensation. If compensation is to be used, it should only be as a last resort; and in designing a compensation proposal, best practice approaches and the principles of offsetting should be followed as much as possible
- Although biodiversity offsetting is not required under the RMA, the Resource Legislation Amendment Act (2017) has increased the prominence of offsetting, and offsetting is clearly identified as a mechanism which can be offered by applicants to address project impacts on biodiversity. Planning provisions can also support the use of biodiversity offsets, for example identifying that no-net-loss and preferably a net-gain in biodiversity values is an objective in biodiversity management, and identifying the use of biodiversity offsets as appropriate in achieving this.
- Mitigation and biodiversity offsetting are not the same thing. Conditions on mitigation can be required by a decision-maker but an applicant cannot be required to provide an offset or environmental compensation.

1.1 Biodiversity offsetting

1.1.1 What is biodiversity offsetting?

A biodiversity offset is:

> ***A measurable conservation outcome resulting from actions designed to compensate for residual, adverse biodiversity effects arising from activities after appropriate avoidance, remediation, and mitigation measures have been applied. The goal of a biodiversity offset is to achieve no-net-loss, and preferably a net-gain, of indigenous biodiversity values.***

The RMA does not provide a definition for biodiversity offsetting (nor does any other New Zealand legislation). A definition for biodiversity offsetting is provided within the New Zealand Government's Guidance on Good Practice Offsetting[1] (the Good Practice Guidance), although definitions previously used by many practitioners and some councils have differed from that definition. The definition provided here differs slightly from that within the Good Practice Guidance in that the terminology used in this definition has been altered to align with that of the RMA. The meaning and intent of the two definitions is the same, but this definition is more appropriate for applications of offsetting under the RMA.

1.1.2 What is the difference between 'no-net-loss' and 'net-gain'?

A no-net-loss offset aims to return biodiversity values to the point they would be anyway, that is, without the impact or the offset. A fully successful no-net-loss biodiversity offset does not halt the decline of biodiversity as it only provides biodiversity gains which are equivalent to losses, and only for the elements of biodiversity targeted in the exchange. A net-gain offset, by contrast, generates biodiversity values that are greater than they would be anyway (without the impact or the offset) (Figure 2), but again, only for those elements of biodiversity targeted in the exchange. The conservation gain achieved under a net-gain offset is only the proportion above the point of no-net-loss — the remainder of the offset cannot be counted as a gain as it is accounting for the biodiversity losses.

1.1.3 Is biodiversity offsetting the same as environmental compensation?

Environmental compensation is designed to compensate for losses but is not designed to demonstrate a no-net-loss outcome, and therefore does not have to fully account for and balance losses and gains. It is typically a more subjective process than biodiversity offsetting and it is not required to adhere to any of the principals of biodiversity offsetting, especially no-net-loss or net-gain objectives. Therefore, environmental compensation is not biodiversity offsetting, or a form of offsetting at all.

Environmental compensation carries the greatest risk for biodiversity outcomes and is the last resort in the effects management hierarchy (Figure 2). To improve outcomes from compensation, best practice and the offsetting principles should be followed as much as possible.

See also: CHAPTER THREE: Biodiversity offsetting versus environmental compensation

(1) New Zealand Government 2014. Guidance on Good Practice Biodiversity Offsetting in New Zealand. New Zealand Government, Wellington.

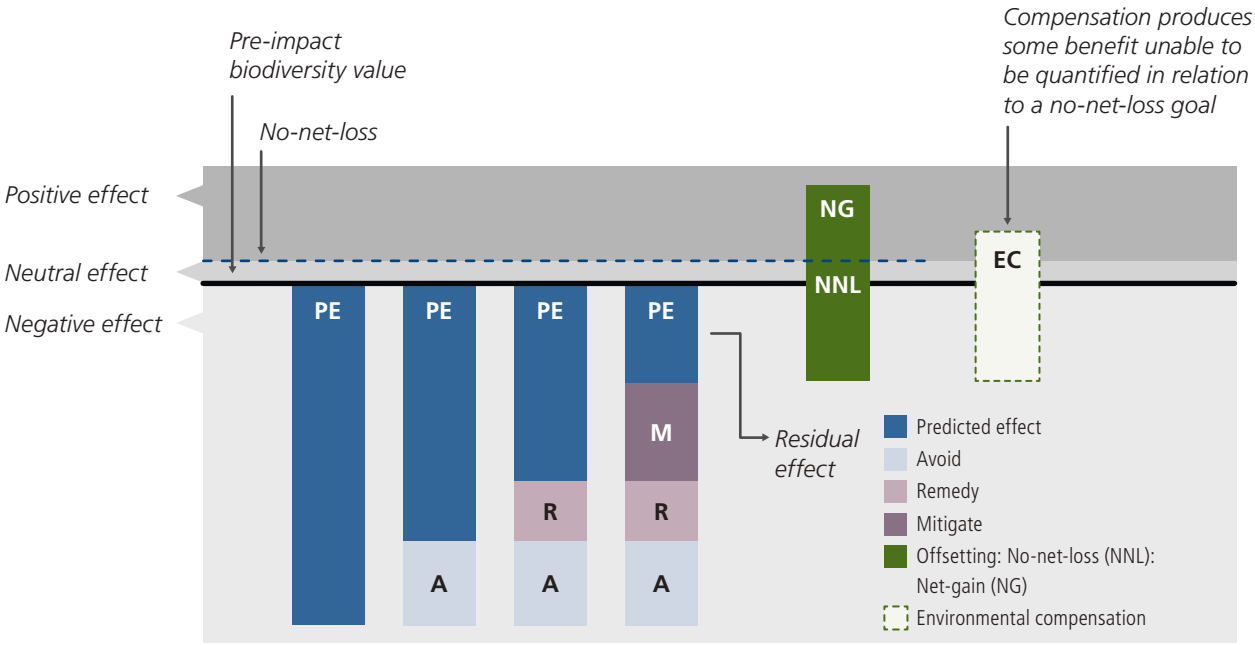


Figure 2: Conceptual illustration of the effects management hierarchy progressing from avoidance (least risk and most certainty) to environmental compensation (greatest risk and least certainty) and showing the difference between a neutral 'no-net-loss' and positive 'net gain' outcome. The no-net-loss line is above the pre-impact biodiversity value as more gains than losses are required to achieve no-net-loss when accounting for uncertainty and time-lags.

1.1.4 What are the principles that underpin biodiversity offsetting?

Biodiversity offsetting is based on a series of widely accepted principles that illustrate the level of rigour required that differentiates offsetting from environmental compensation. It is this rigorous process and the objective, quantified evaluation associated with biodiversity offsetting which make it a preferable option to environmental compensation.

The most frequently-cited guiding principles for biodiversity offsetting are those developed by BBOP[(2)] which includes principles on science, social, culture and policy matters. Several of the BBOP principles, especially those regarding cultural values and knowledge, stakeholder consultation, and the effects management hierarchy are already embedded within the RMA.[(3)] As such, these principles are either addressed directly by the provisions of the RMA, or can be applied most effectively through the development of policy approaches in RMA plans and policy statements, or in non-statutory supporting material (e.g. local biodiversity strategies). However, five of the BBOP principles are not already captured by the RMA and are relevant and applicable to the use of biodiversity consent decision making under the RMA. 'Ecological equivalence' is also included as an additional principle, as demonstrating ecological equivalence is a fundamental step in the process of designing and evaluating an offset proposal (Table 1).

These principles provide a checklist of design considerations of a well-developed and well-applied offset to be considered in consenting processes.

(2) BBOP. 2013. An overview of the BBOP programme. www.forest-trends.org
(3) Particularly in section 88; Schedule 4 assessments of effects, of which offsetting forms a part.

Table 1: Principles that underpin good biodiversity offsetting, the first six having particular applicability to the use of biodiversity offsetting in consent decision making under the RMA, as they cover key concepts not captured elsewhere. Estimating ecological equivalence is fundamental for evaluating the adequacy of an offset proposal and is dealt with in more detail in Chapter Three. The remaining five BBOP principles are also underpinning principles of biodiversity offsetting that should be given consideration when designing an offset proposal, but their application is more prescribed or circumscribed by the RMA, and apply to a broader range of circumstances than solely biodiversity offsetting. They are included here for completeness.

Principle	Explanation
Limits to offsetting	Many biodiversity values are not able to be offset, and if they are impacted then they will be permanently lost. These situations include where: • residual impacts cannot be fully compensated for by a biodiversity offset because of the irreplaceability or vulnerability of the biodiversity affected; and • there are no technically feasible or socially acceptable options by which to secure gains within acceptable timeframes. In either situation, an offset would be inappropriate. This principle reflects a standard of acceptability for offsetting, and should not be seen as a pathway to allow uncompensated losses. The project should be redesigned wherever possible to avoid effects that cannot be offset. Alternatively, the consent can be declined, or the Applicant may propose some form of compensation. These limits may be identified during a consenting process, and/or through specific statutory (e.g. an RMA plan) or non-statutory provisions (e.g. a local biodiversity strategy).
No-net-loss and preferably a net-gain	The goal of a biodiversity offset is a measurable outcome that can reasonably be expected to result in no-net-loss, and preferably a net-gain of biodiversity. A no-net-loss outcome requires that at a specified point in time biodiversity values will be returned to the point they would have been if the impact and offset had not occurred. No-net-loss is measured by type, amount, and condition and requires explicit statements describing: a. the elements of biodiversity for which a no-net-loss outcome is sought; b. the assumed background biodiversity trajectory against which no-net-loss is evaluated; and c. the time horizon within which a no-net-loss outcome is to be achieved.
Landscape context	The design of a biodiversity offset should consider the landscape context of both the impact site and the offset site, taking into account interactions between species, habitats, and ecosystems, spatial connections, and system functionality; Consideration of landscape context is captured in the assessment of ecological equivalence across space and time. It can be informed by local biodiversity strategies/priorities, where these can support appropriate outcomes in specific circumstances.

Principle	Explanation
Additionality	A biodiversity offset must achieve gains in biodiversity above and beyond gains that would have occurred anyway in the absence of the offset. This requires evaluating the change in biodiversity value under both a 'with offset' and a 'without offset' scenario to estimate the amount of additional gain that can be attributable to the offset action. Some aspects of an offset proposal may meet additionality rules, while other proposed actions may not. In such cases, only the amount of gain that can be demonstrated to be additional should count towards the overall offset.
Permanence	The biodiversity benefits at an offset site should be managed to secure outcomes that last at least as long as the impacts and preferably in perpetuity. To achieve or sustain gains long-term requires a well-designed monitoring and reporting programme and an adaptive management approach to adjust management as necessary.
Ecological equivalence	Ecological equivalence describes the degree to which the biodiversity gain attributable to an offset is balanced with the biodiversity losses due to development across type, space, and time; and therefore, whether the exchange achieves no-net-loss. Assessing ecological equivalence requires the biodiversity at both the impact and the offset site to be described and measured to quantify losses and gains. Demonstrating ecological equivalence differentiates biodiversity offsetting from environmental compensation.
Adherence to the mitigation hierarchy	A biodiversity offset is a commitment to redress significant residual adverse impacts. In an RMA context offsets should only be contemplated after steps to avoid, remedy, or mitigate adverse effects have sequentially been exhausted, and thus applies only to residual biodiversity impacts.
Stakeholder participation	The effective participation of stakeholders should be ensured in decision-making about biodiversity offsets, including their evaluation, selection, design, implementation, and monitoring. Stakeholders are best engaged early in the process.
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.
Science and Traditional Knowledge	The design and implementation of a biodiversity offset should be a documented process informed by science, including an appropriate consideration of traditional knowledge.(4)
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. This includes consideration of effects on local communities in relation to both the impact and offset sites.

(4) In NZ, Mātauranga Māori could inform the identification of areas of value, and the design and implementation of biodiversity offsets, although any such assessment will likely traverse a wider range of values than biodiversity alone. Māori may indicate to councils their level of interest in the use of biodiversity offsets, for example through Mana Whakahono ā Rohe (iwi participation agreements) with local authorities.

1.2 Biodiversity offsetting and the Resource Management Act

1.2.1 Is biodiversity offsetting required under the Resource Management Act?

There is no requirement under Part 2 of the RMA for an applicant to provide an offset or environmental compensation to address the effects of a proposal for which a consent is necessary. However, the 2017 amendment to the RMA[5] makes offsetting more prominent, clarifying and confirming the existing position which has been developed through case law. The amendment provides that a consent authority must have regard to any measure proposed or agreed by an applicant[6] or requiring authority[7] for the purpose of ensuring positive effects on the environment to offset or compensate for any adverse effects. As a result, it can reasonably be expected that there will be an increased use of offsets or compensation within resource consent applications. While the amendment includes both offsetting or compensation, it should be remembered they are two very different actions with different outcomes for biodiversity.

See also: CHAPTER THREE: Biodiversity offsetting versus environmental compensation

As the law does not specifically require offsets, it is up to the applicant to offer an offset, or for the decision-maker to decide what may be necessary or appropriate to achieve the biodiversity objectives and policy of a plan, and/or to address the effects arising in any situation. While a consent authority cannot require the provision of an offset, they may conclude that providing an offset might be the only practical way to meet the requirement in the RMA (and potentially the relevant plan biodiversity objectives and policy) to adequately address the effects of a particular proposal.

Under the RMA, offsets and environmental compensation can be considered under:

d. Section 104(1)(a) which requires the consideration of positive effects on the environment proffered by the applicant in consideration for allowing the activity; or

e. Section 104(1)(ab) which provides for positive measures proposed or agreed to by an applicant to offset or compensate for adverse effects; or

f. Section 168(a)(3)(a) and Section 171(1)(b) which relate to notice of requirements and recommendations by the consenting authority.

Depending on the circumstances, biodiversity offsets and environmental compensation are likely to be relevant to, and sometimes necessary for reasons including:

- the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna (section 6(c));
- maintaining the indigenous biodiversity of a region/local area (section 30 (1)(ga) and 31(1)(b)(iii));
- the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga (section 6(e);
- the maintenance and enhancement of the quality of the environment (section 7(f));
- applying the principles of the Treaty of Waitangi (Te Tiriti o Waitangi); and
- addressing effects which remain significant after all reasonable mitigation has been undertaken.

(5) Resource Legislation Amendment Act 2017
(6) Section 104(1)(ab) RMA
(7) Section 171(1B) RMA

1.2.2 Where does biodiversity offsetting sit on the continuum of managing effects under the Resource Management Act?

The management of effects under the RMA can be represented visually as a continuum of responses with the effects management hierarchy at one end and offsetting and compensation at the other end (Figure 3). The continuum reflects that offsetting must only be considered after avenues to avoid, remedy, or mitigate onsite have been exhausted. It also illustrates that offsetting (and compensation) are the most high-risk responses to effects management. Certainty about achieving successful outcomes for biodiversity decreases further along the continuum from avoidance to offsetting.

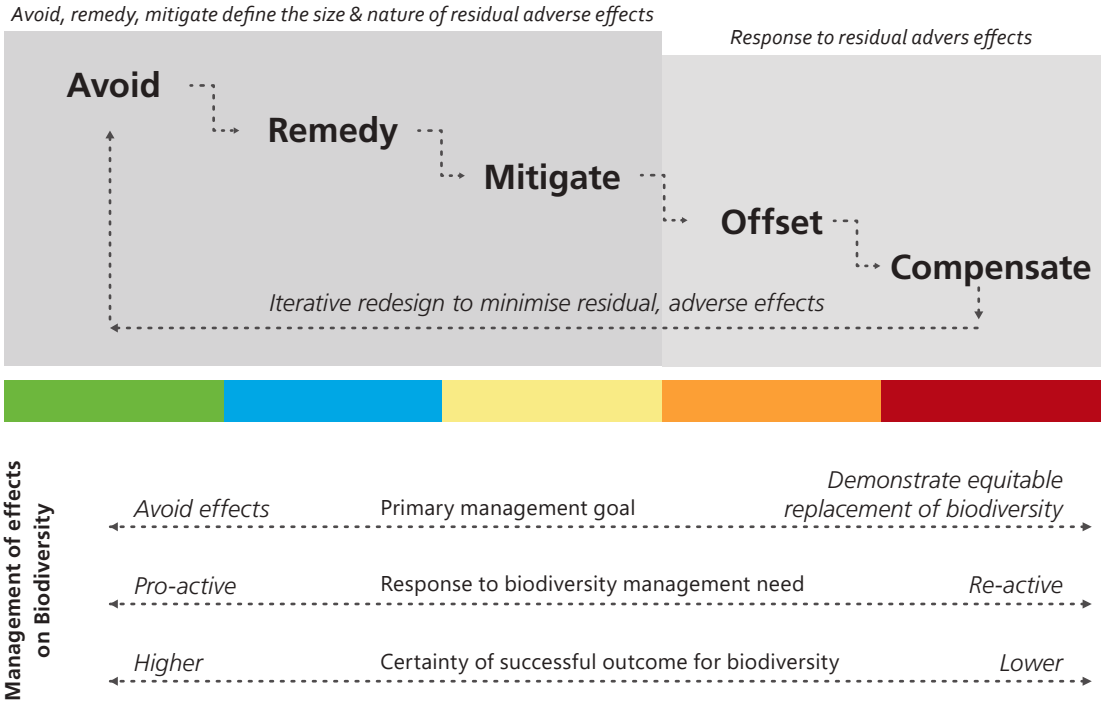


Figure 3: The continuum of responses for the management of effects. Certainty about achieving successful outcomes for biodiversity decreases at each step along the continuum (moving left to right).

1.2.3 What is the difference between biodiversity offsetting and mitigation under the Resource Management Act?

Mitigation and a biodiversity offset are not the same thing. To 'mitigate' means to alleviate, or moderate the severity of something. Offsets do not do that. This is because offsets do not simply reduce adverse effects, but rather they seek to achieve biodiversity gains that are equivalent to the residual biodiversity losses (or greater, to achieve a net-gain offset). As such, biodiversity offsets should only be only considered after all reasonable possibilities to avoid, remedy, or mitigate are exhausted. Therefore, biodiversity offsets must be distinguished from mitigation, and this is increasingly reflected in case law and resource management plans.[8]

Biodiversity offsetting is not simply 'mitigation with numbers'

Biodiversity offsetting is not simply 'mitigation with numbers', it is a process underpinned by a set of principles. If any of these principles, and particularly the no-net-loss goal, are not met, then the action is not a biodiversity offset, but rather some form of mitigation or compensation.

The RMA recognises this distinction and differentiates between mitigation of adverse effects caused by the activity for which resource consent is being sought, and positive effects offered by the applicant as an offset to adverse effects caused by the proposed activity.

While it is common for a resource consent application to include a bundle of mitigation, compensation, and offset actions, they are not the same things. It is critical to the decision-making process that it is transparent what is being offset, what is being mitigated, and what is only being compensated.

The key implication of the distinction between offsetting and mitigation is that an applicant cannot be required to provide offsetting or environmental compensation to achieve an outcome, whereas conditions on mitigation can be required by a decision maker.[9] In practice this may not be a major issue. A decision-maker can decline an application if they consider that sustainable management can only be achieved if some form of offset or environmental compensation is necessary, and the applicant does not offer it or accept such a condition.

The distinction between mitigation and offsets is also important, however, in the following situations:

a. The consent authority assessing whether an application requires public notification under section 95A(2)(a) can only consider whether the adverse effects of the activity are more than minor, and any positive effects anticipated to be bought about due to a proposed offset cannot be taken into account when evaluating whether effects are more than minor as the offset occurring cannot be ensured; or

b. If the activity concerned is a non-complying activity, the anticipated positive outcomes from a proposed offset may not be considered in the 'no more than minor' threshold test in section 104D and this has implications for whether the council may grant consent for the non-complying activity.[10]

(8) Royal Forest and Bird Protection Society of New Zealand v Buller District Council and West Coast Regional Council and others, [2013] NZHC 1346, Fogarty J. This distinction is followed for example in the IHP report to the Auckland Council on the Unitary Plan Topic 006-010 22/7/2106 in Section 8.2 where it stated: "...offsetting is not an alternative to avoiding, remedying and mitigating adverse environmental effects, but an opportunity to offset residual effects where they have not been able to be avoided, remedied or mitigated"

(9) For example, see section. 8.2.1 of the IHP Report on the Auckland Unitary Plan Topic 006

(10) Ministry for the Environment. Departmental Report No. 2. Resource Legislation Amendment Bill 2015. Page 324.

Case study

The High Court decision regarding mitigation in the Escarpment Mine case

The usual meaning of "mitigate" is to alleviate, or to abate, or to moderate the severity of something, and this should be taken as conclusive until changed by the court or Parliament.

The High Court in the Escarpment Mine decision[11] decided that:

- mitigation must address effects "at the point of impact"; and
- biodiversity offsets do not alleviate, abate, or moderate the severity of something and therefore they are not mitigation.

The Court provided an example that if open cast mining will destroy the habitat of an important species of snail (an adverse effect) it cannot be said logically that enhancing the habitat of snails elsewhere in the environment mitigates that adverse effect.

(11) Royal Forest and Bird Protection Society of New Zealand v Buller District Council and West Coast Regional Council and others, [2013] NZHC 1346, Fogarty J.

Case study

Consistency between the biodiversity offsetting mitigation hierarchy and the RMA avoid, remedy, mitigate

In addressing the question of the applicability of a 'mitigation hierarchy' to the RMA, the Board of Inquiry in the Transmission Gully plan change decision[12] found:

a. The use of the mitigation hierarchy was supported by ecological evidence that in a practical sense avoidance of adverse effects was the natural and preferred outcome in any situation, followed by remediation/mitigation. The lack of preference between remediation and mitigation reflected the desire to have all options available (following avoidance) to achieve the best environmental outcomes; and

b. Although the RMA does not explicitly require the application of the 'mitigation hierarchy' by not providing a preference between avoidance, remedy or mitigation, the Wellington Regional Freshwater Plan sought to preserve, safeguard and protect natural values. Although those concepts do not require absolute avoidance of adverse effects, they support a preference for avoidance as a starting point before consideration of the other alternatives (including offsetting). This view was supported by the ecologists' evidence that avoidance of adverse effects was a natural first step and preferred as an outcome.

The Board concluded:

"... we considered that maintaining provision for avoidance to the extent practicable as a preferred first category, indicates that in all cases the initial objective should be to avoid effects on the natural character of the water bodies affected by the Transmission Gully Plan. If adverse effects cannot practicably be avoided then the ability to remedy and mitigate (including by offsetting[13]) would provide any future consent authority with the ability to consider all possible methods of management of adverse effects in order to achieve the best overall environmental outcome."

(12) Final Decision and Report of the Board of Inquiry into the New Zealand Transport Agency Transmission Gully Plan Change Request. October 2011 (paragraph 245).
(13) This is a direct quote from the Transmission Gully decision (paragraph 251), which was made at a time when it was commonly thought offsetting was a type of mitigation and before the High Court Bathurst Escarpment Decision, which clarified offsetting was not mitigation. This distinction between mitigation and offsetting and their place in the hierarchy is reiterated in this guidance.

Chapter Two

Including biodiversity offsetting policies in statutory policy and planning instruments

This chapter provides recommendations for including biodiversity offsetting in policy and planning documents under the RMA and is likely to be of most interest to policy analysts, consent planners, and decision-makers.

Recommended provisions for biodiversity offsetting policy:

- No-net-loss, or preferably net-gain, must be an objective of a biodiversity offset.
- The provisions of an offset policy should apply to any indigenous biodiversity.
- The level of residual effect subject to offset provisions should be informed by the importance of the affected biodiversity.
- Environmental compensation should be provided for as a 'last resort' after all avenues to avoid, remedy, or mitigate have been exhausted and offsetting has been demonstrated to be not possible or appropriate.
- The option to use trading-up offsets should be restricted, to circumstances where, the conservation outcome is demonstrably better than a like-for-like exchange in the same situation, for example by trading non-threatened biodiversity for threatened biodiversity (species, habitat, or systems). In all cases, the methodology by which the biodiversity values subject to the exchange are measured, weighted, and balanced must be transparent and defensible.
- Offset provisions should allow for the consideration of offsets provided in advance.
- The plan should provide high-level guidance in support of the offset policies to assist in applying the offset provisions and a framework for the general design of an offset.

2.1 What might an effective policy framework for biodiversity offsetting look like?

The RMA does not provide any direction on setting objectives for offsetting (such as requiring 'no-net-loss' or a 'net-gain') or criteria for assessing the appropriateness of an offset or compensation if it is offered. Nor are the concepts of 'biodiversity offset', 'no-net-loss', 'net gain', or 'environmental compensation' defined in the RMA or any other legislation. There is also no national policy instructing or guiding the use of biodiversity offsets in New Zealand.

Despite this, councils are beginning to include biodiversity offset provisions in their statutory plans and policy statements. Three examples are Horizons Regional Council, Auckland Council, and Christchurch City Council. All three sets of provisions have been the subject of detailed legal submissions and expert evidence.(1)

The biodiversity offsetting provisions in these plans have some inconsistencies in how they address the following issues:

1. Should no-net-loss or net-gain be a specific requirement of the policies themselves (as opposed to being part of the definition of a biodiversity offset)?
2. Should the provisions on biodiversity offsets apply to residual effects on all indigenous biodiversity or just 'significant' biodiversity (whether or not specific significant areas are identified in the relevant plan)?
3. What level of residual effects should be the subject of biodiversity offsets?
4. How should 'trading-up' be addressed?
5. Can offsets which are provided in advance of a project being consented be considered by a decision-maker?
6. Should the policies address 'environmental compensation', and if so, how?
7. How should the policies refer to the Good Practice Guidance?
8. What definitions should be used?

This guidance provides recommendations on how to address these issues and provide for biodiversity offsetting within regional policy statements and/or regional and district resource management plans (Table 2). Recommended wording for offsetting policies is provided in the Appendix.

(1) Horizons' One Plan was approved by the Environment Court in 2012; Auckland Council made decisions on the Auckland Unitary Plan following an Independent Hearings Panel process in 2016; the Christchurch Replacement City Plan was also approved by an Independent Hearings Panel in 2016. Both Independent Hearings Panels hearing the Auckland and Christchurch Plans included Environment Court judges and expert commissioners

Table 2: Recommended provisions for biodiversity offsetting policy within regional policy statements and/or regional and district resource management plans. These recommendations specifically relate to biodiversity offsetting under the RMA and within an effects management context. AUP = The Auckland Unitary Plan; CP = The Christchurch Replacement City Plan; OP = Horizons' One Plan

Recommendation	Explanation	Comment
No-net-loss, or preferably net-gain, should be referenced in a plan as an objective of a biodiversity offset	Plans should clearly establish that the no-net-loss, and preferable a net-gain, objective applies to those elements of biodiversity which are the target of the offset, and preferably to as many elements of biodiversity as possible where residual impacts occur. Policy can give further guidance, for example including how to address situations where a no-net-loss goal cannot be achieved for any or all elements of biodiversity affected. Plans can further specify that, as a last resort, environmental compensation may be appropriate for those elements of biodiversity for which no-net- loss is defensibly shown to not be achievable. This allows the flexibility needed to consider a 'package' of responses to effects including mitigation, offsets, and compensation. Supporting policy can give guidance on implementing this in consent processes.	Wherever a no-net-loss or net-gain objective is sought, the plan should be explicit that offset proposals should identify: • which elements of biodiversity; • in comparison to what; and • over what time horizon no-net-loss or net-gain is desired for. The Auckland Unitary Plan identifies in an appendix on biodiversity offsetting that "where possible, the overall result should be no-net-loss, and preferably a net-gain in ecological values."
The provisions of an offset policy should apply to any indigenous biodiversity	This is an appropriate approach in the context of achieving sustainable management through managing the effects of a consented activity. A hierarchical policy approach is recommended to distinguish between areas of significant indigenous vegetation and significant habitats of indigenous fauna compared to other indigenous biodiversity. In this way policy provisions can distinguish between 'protection' for matters of national importance and 'management' of all other values. In both cases, the effects management hierarchy should be captured within the policy.	The importance of significant vegetation and habitats compared to other vegetation and habitats can be provided for by specifying different levels of vegetation clearance for different activity classifications (permitted, controlled, discretionary and non-complying), recognising that it is only significant effects on other values which are to be addressed, and providing that environmental compensation can be 'considered' rather than 'encouraged' for residual effects on other values when an offset is not available. The provisions within both the AUP and the CP allow for biodiversity offsets in relation to any indigenous biodiversity.

Recommendation	Explanation	Comment
The level of residual effect subject to offset provisions should be informed by the importance of the affected biodiversity	For areas identified as significant for the purposes of section 6(c) RMA, whether or not these areas are listed in the relevant plan, any reasonably measurable residual effects should be subject to the offset provisions. For other biodiversity, the offset provisions should apply to any significant residual effects.	For any biodiversity, the offset provisions should provide only for residual effects after all avenues to avoid, remedy, or mitigate have been exhausted.
Environmental compensation should be provided for as a 'last resort' after all avenues to avoid, remedy, or mitigate have been exhausted and offsetting has been demonstrated to be not possible or appropriate, but should be guided by principles in the same manner as an offset, to the extent practicable	Environmental compensation is the least certain of way to address effects. Accepting environmental compensation is accepting that biodiversity losses will not be accounted for. Therefore, environmental compensation must be clearly defined as the final option in the hierarchy of effects management and only applied to residual effect where it has been demonstrated that an offset as defined by the plan cannot be achieved. While not encouraged (and 'short-cuts' directly to environmental compensation should not be allowed), the provisions should nonetheless recognise that, failing all other options, environmental compensation can provide an opportunity for a 'better than nothing' outcome. However, 'short-cuts' directly to environmental compensation should not be allowed.	The offset provisions should recognise that any environmental compensation proposed should generally follow the principles/guidance for an offset.

Recommendation	Explanation	Comment
The option to use trading-up offsets should be restricted to circumstances where the conservation outcome is demonstrably better than a like-for-like exchange in the same situation	'Trading-up' involves an out-of-kind exchange of biodiversity, and is only considered an offset where that exchange demonstrably results in a better conservation outcome, for example trading non-threatened biodiversity for threatened biodiversity. Out-of-kind exchanges of any other type are not offsets, but environmental compensation. Trading-up offsetting sometimes provides an opportunity to achieve conservation gains considered to be adequate and appropriate to demonstrate equivalence with that lost (in terms of value, if not in terms of type), which can be a greater conservation gain than that provided by a no-net-loss exchange of like-for-like of non-threatened biodiversity in some cases. Determining an adequate and appropriate trading-up offset exchange forms part of the offset design.	The offset design would need to demonstrate how a trading-up offset provides an equivalent or greater exchange of biodiversity. The CP and the OP address trading-up within the design of the offset.
Offset provisions should allow for the consideration of offsets provided in advance where possible, noting that here are no existing mechanisms to recognise or administer offsets provided in advance	An offset provided in advance can be a useful mechanism to secure biodiversity gains as it reduces the level of uncertainty about outcomes. Plans should allow for consideration of offsets provided in advance only when there is a clear link between the offset and the residual effect (that is, the offset can be shown to have been created in anticipation of the specific effect), and there is a defined baseline to demonstrate the biodiversity gains already in place when the offset is considered. Providing an offset in advance forms part of the offset design.	

Recommendation	Explanation	Comment
The plan should provide a framework for the use of biodiversity offsets in support of the offset policies	This would provide the explanations and definitions needed to implement the plan provisions and a high-level generalised framework to guide the design of an offset. Appending the framework to the plan allows for greater clarity, although it is not legally significant whether it sits as an appendix or within the policies themselves. More detailed guidance would sit outside the plan (e.g. this document, the Good Practice Guidance, and BBOP).	See Appendix (policy 3).
External documents such as the Good Practice Guidance can be a useful tool in the design of offsets, but should not be specifically depended on at a policy level.	A resource management plan should set out the overarching policy direction and not rely on reference to external documents such as the Good Practice Guidance to further describe the policy. For example, the Good Practice Guidance outlines policy approaches only at a high level, and in a broader framework than just the RMA, and thus does not address the specific requirements of good RMA policy in relation to the use of biodiversity offsetting.	Both the CP and AUP refer to the Good Practice Guidance being read 'in conjunction with' the plan policies, which is unclear in terms of the strength of dependence and which parts of the Good Practice Guidance are or are not relevant to RMA considerations.

Chapter Three

Evaluating the adequacy of offset proposals

This chapter provides guidance on the necessary requirements for a proposal to be an offset. It covers the fundamental difference between biodiversity offsetting and compensation, how to determine whether offset gains are additional, and provides guidance for demonstrating ecological equivalence to ensure an offset proposal meets no-net-loss (or net-gain) objectives. This chapter is likely to be of most interest to anyone designing or evaluating offset proposals.

Key Messages

- Biodiversity offsetting and environmental compensation generate very different outcomes for biodiversity with no-net-loss offsetting only providing biodiversity gains equivalent to biodiversity losses, and net-gain offsets providing a greater opportunity for good biodiversity outcomes. In contrast, compensation may generate positive outcomes, is much more uncertain and does not aim to provide biodiversity gains equivalent to residual biodiversity losses and is thus a high-risk response to effects management.
- Trading-up' offsetting is a form of out-of-kind biodiversity trade (exchanging one type of biodiversity for a different type of biodiversity) that aims to achieve a greater conservation outcome than would be achieved with a like-for-like exchange in the same situation. For example, trading a loss of non-threatened biodiversity for a gain in threatened biodiversity. These are a form of offset, whereas out-of-kind exchanges that do not trade-up only provide some level of compensation, and are not offsets. Expert assessment and evaluation are required to determine the adequacy of a trading-up offset, and they should be used instead of like-for like exchanges only where there is a high degree of confidence that the outcome is demonstrably better.
- Demonstrating ecological equivalence across type, space, and time as a measure of similarity in an exchange of biodiversity losses and gains is a fundamental step in evaluating the appropriateness and adequacy of an offset proposal and whether the offset is likely to achieve a no-net-loss (or net-gain) objective.
- Within an RMA context, it is common for a proposal to include a combination of mitigation, offset, and environmental compensation. While these can each provide ecological benefits, it is important to differentiate between them so that the decision maker is clearly informed of a) the nature and consequence of the residual effects and b) which of these residual effects have been neutralised (offset) and which are being compensated for, but need to be tallied as losses.

3.1 Biodiversity offsetting versus environmental compensation

3.1.1 How does biodiversity offsetting differ from environmental compensation?

Any response to managing residual adverse effects can be placed on a continuum ranging from offsetting as a systematic and transparent process of decision-making, through to other compensatory measures which do not meet any of the offset principles and usually rely upon judgment alone. Under the RMA, compensation is not restricted to environmental compensation and can include any form of compensation. Therefore, there are four states along the offset–compensation continuum:

1. **Like-for-like offset.** The residual effect is offset to a no-net-loss or net-gain level by exchanging the same type of biodiversity in accordance with all of the offset principles.
2. **Trading-up offset.** An out-of-kind exchange of biodiversity that demonstrably exchanges biodiversity of a lesser conservation value for biodiversity of greater conservation value. Meets key offset principles except equivalence of type, but is considered to overall deliver an equivalent or improved outcome, because the biodiversity gained is considered to be of greater conservation importance to the biodiversity lost. No standard metrics are currently available to evaluate the exchange so trading-up involves an element of subjectivity and societal preference.
3. **Environmental compensation.** Non-quantified biodiversity benefits are offered to compensate for biodiversity losses. The compensation actions may benefit different biodiversity to that lost (out-of-kind compensation), including biodiversity of lesser conservation concern than that lost. Compensation is not quantified or balanced with losses and may involve subjective decision-making subject to socio-political influences.
4. **Other compensation.** Compensation that does not benefit biodiversity in exchange for biodiversity losses. For example, building a playground in exchange for the loss of a wetland. Non-biodiversity compensation is subjective and will be highly pliable to socio-political influences.

Compensation is not a Biodiversity Offset

Environmental compensation is designed to recompense for losses, but does not aim to measure and balance gains with losses as offsetting does. Any compensatory proposal that does not align with the principles of biodiversity offsetting should not be considered to be an offset. This includes any form of compensation:

- Where gains and losses have not been measured and balanced.
- Where gains are not at least equivalent to losses, or where exchanges are 'out-of-kind'.
- That exchanges losses in biodiversity values for gains in social or cultural values.
- That provides fiscal compensation in exchange for biodiversity losses.[1]
- That undertakes research, monitoring, awareness, or advocacy in exchange for biodiversity losses.

Environmental compensation is the 'last resort' option within the effects management hierarchy and carries the most risk. While the endpoint of environmental compensation can be a socially acceptable positive outcome, and have significant biodiversity benefits, there is currently no accepted system by which the benefits generated by environmental compensation, which often involve out-of-kind exchanges can be objectively measured against losses. Therefore, the level of certainty that the benefits will be adequate to compensate for the losses is much lower compared with an offset. Decision-makers may consider that the proposal does not adequately compensate for the biodiversity losses that will result from the activity and decline the resource consent.

Environment compensation provides the opportunity to address residual biodiversity losses that are not or cannot be offset, either for ecological, technical, or social reasons — but should only be explored as a last resort. Although environment compensation does not require the same numerical rigour as offsetting, outcomes can be improved if offset principles are applied as a guideline when designing compensation packages.

Under the RMA, a single project proposal may include a mix of mitigation for some biodiversity values, no-net-loss offsets for some biodiversity values, trading-up offset measures for some biodiversity values, and fully subjective compensation for yet other biodiversity values. In such cases, a no-net-loss offset can only be claimed for those values where this is demonstrated and not at the project level (unless all relevant components are addressed to at least a level of no-net-loss). While, the council or hearing panel may well consider a package of mitigation, offset, and compensation to, on balance, adequately compensate for the impacts of the project, it should always remain transparent which biodiversity values have been mitigated, offset, or compensated for (Figure 4).

(1) This does not include payment by an applicant for offset actions to be undertaken by a third party provided this is done in accordance with an offset plan and the proposal has been shown to meet the principles and rules required to be considered an offset.

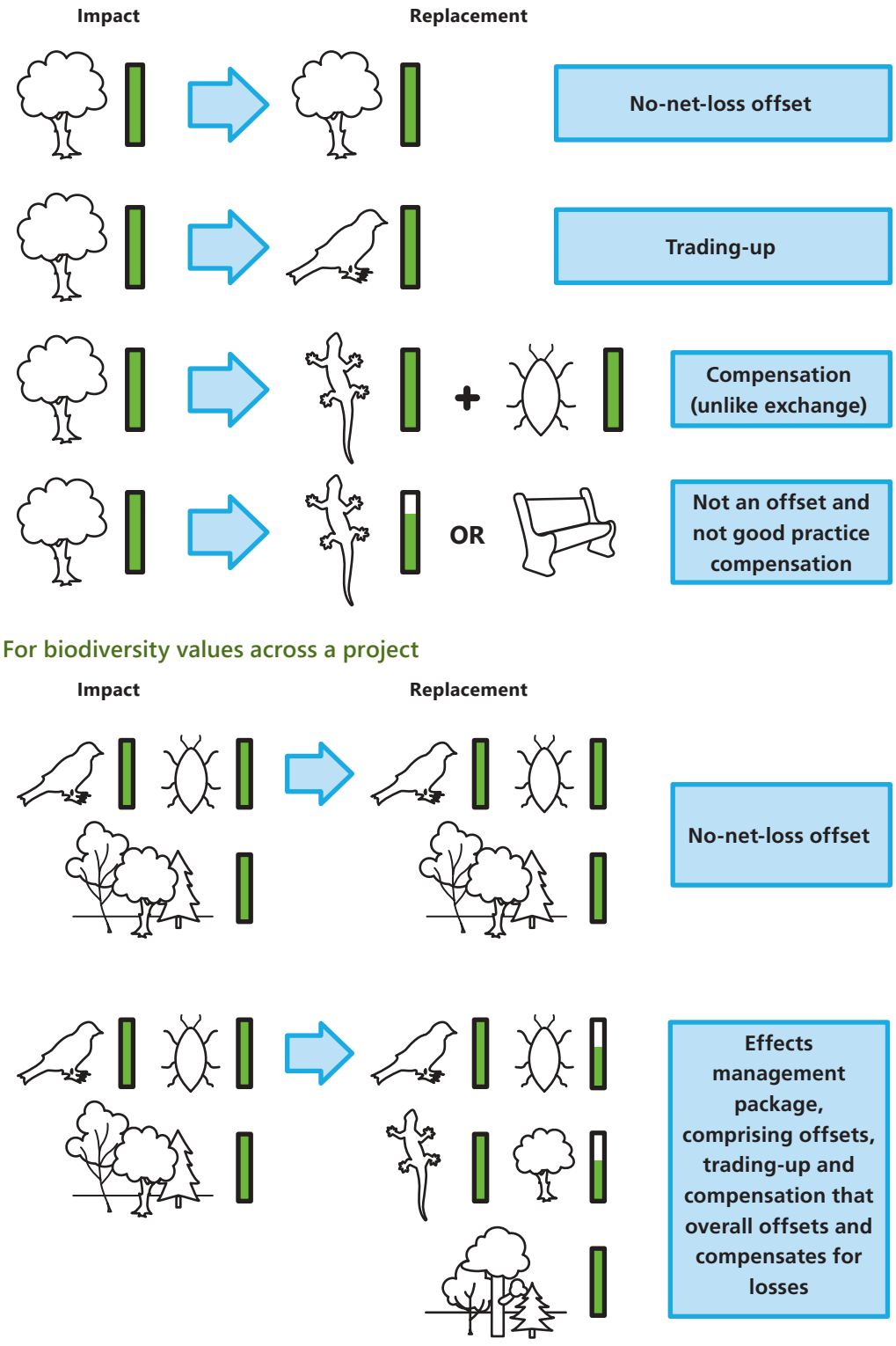


Figure 4: Illustration of effects management approaches along the offset-compensation continuum. The type of effects management approach are defined by the type and magnitude of biodiversity outcomes, with green bars representing the amount of biodiversity value lost at the impact site, and the full or partial replacement of that value using the various approaches described. The left panel considers one component of valued biodiversity (in this case a population of a type of tree). The right panel illustrates two different effects management packages when considering effects on different biodiversity across a project. Claiming an offset at a project level requires that all impacted values are fully replaced in a like-for-like manner. Where offsetting of all affected biodiversity types in accordance with the offset principles is not feasible, an effects management package may comprise a range of management responses that includes representative actions and benefits across the offset-compensation spectrum.

How do we know if compensation is adequate?

There is currently no accepted and objective method of quantifying the value of an exchange between unlike types of biodiversity (environmental compensation), or biodiversity and social values (other forms of compensation). Thus, whether the exchange is appropriate or adequate is subjective. In the case of environmental compensation, this subjectivity is preferably informed by ecological experts. For all types of compensation, it is always a subjective decision-making process, heavily influenced by socio-political influences. Where possible, compensation proposals should seek to align with as many of the offsetting principles as possible. It is also good practice to quantify the benefits anticipated to be delivered as a result of the compensation.

Thus, where adverse effects cannot be avoided (the most preferred option), remedied, or mitigated; biodiversity offsetting is always preferred over environmental compensation, which has the highest risk to biodiversity and the least certainty of outcomes.

3.1.2 Is 'trading-up' biodiversity offsetting or environmental compensation?

'Trading-up' is an out-of-kind exchange of biodiversity. Out-of-kind exchanges trade one type of biodiversity for a different type of biodiversity. Where this exchange involves exchanging the loss of biodiversity of lesser conservation concern for biodiversity of greater conservation concern (e.g exchanging non-threatened species for a gain in a nationally threatened species), it is a form of offsetting; a 'trading-up offset'. Trading-up offsets have some potential to provide better conservation outcomes and in some cases, may be preferable to a like-for-like no-net-loss offset and much more preferable than environmental compensation. However, due to the current lack of metrics and standardised exchange rules[(2)] evaluating trading-up offsets is largely subjective, and difficult to prove. The difficulty and uncertainty associated with evaluating adequacy of trading-up offsets increases as the dissimilarity between the elements of biodiversity subject to the exchange increases (e.g. in terms of type or function).

This guidance recommends that where out-of-kind exchanges do not trade-up, or trade between Threatened Classifications (e.g. trading great spotted kiwi (Nationally Vulnerable) for bittern (Nationally Critical)) they are not considered offsets but environmental compensation.

Evaluating the appropriateness of trading-up offsets

Although trading-up offsets rely on subjective decision-making, they can be guided by existing data and information where a robust value judgement has already been made (e.g. threatened species lists, national conservation priorities).

The difficulty and uncertainty associated with evaluating adequacy of trading-up offsets increases as the dissimilarity between the elements of biodiversity subject to the exchange increases (e.g. in terms of type or function). Decisions on the adequacy and efficacy of offset under a trading-up scenario should include ecology experts able to clearly distinguish the risks and benefits of trades between unlike species, habitats, and ecosystems. Evidence of conservation outcome and an alignment with regional and/or national priorities should be an important consideration in the decision-making process.

(2) Further discussion and a framework of suitability is provided in: Overton JMC, Stephens RTT 2015. Out-of-kind biodiversity offsets and their application in New Zealand. Investigation no. 4556. Landcare Research Contract Report LC2125.

3.2 Demonstrating ecological equivalence to evaluate no-net-loss offset proposals

3.2.1 What is ecological equivalence?

Ecological equivalence refers to the degree of similarity in biodiversity values between impact and offset sites across type of biodiversity; amount of biodiversity; equivalence over time, and spatial context (Figure 5). The concept provides a framework against which to evaluate whether an offset proposal meets no-net-loss biodiversity offset objectives — that is, will estimated biodiversity gains adequately compensate for the development induced losses? Demonstrating ecological equivalence is the crux of designing an offset. It is also subject to the most debate and contention during resource consent processes and is therefore addressed in detail here.

Demonstrating ecological equivalence requires quantitative analysis of biodiversity losses and gains within an objective and repeatable framework. Biodiversity offset accounting models are used to achieve this and are discussed in detail in Chapter Four.

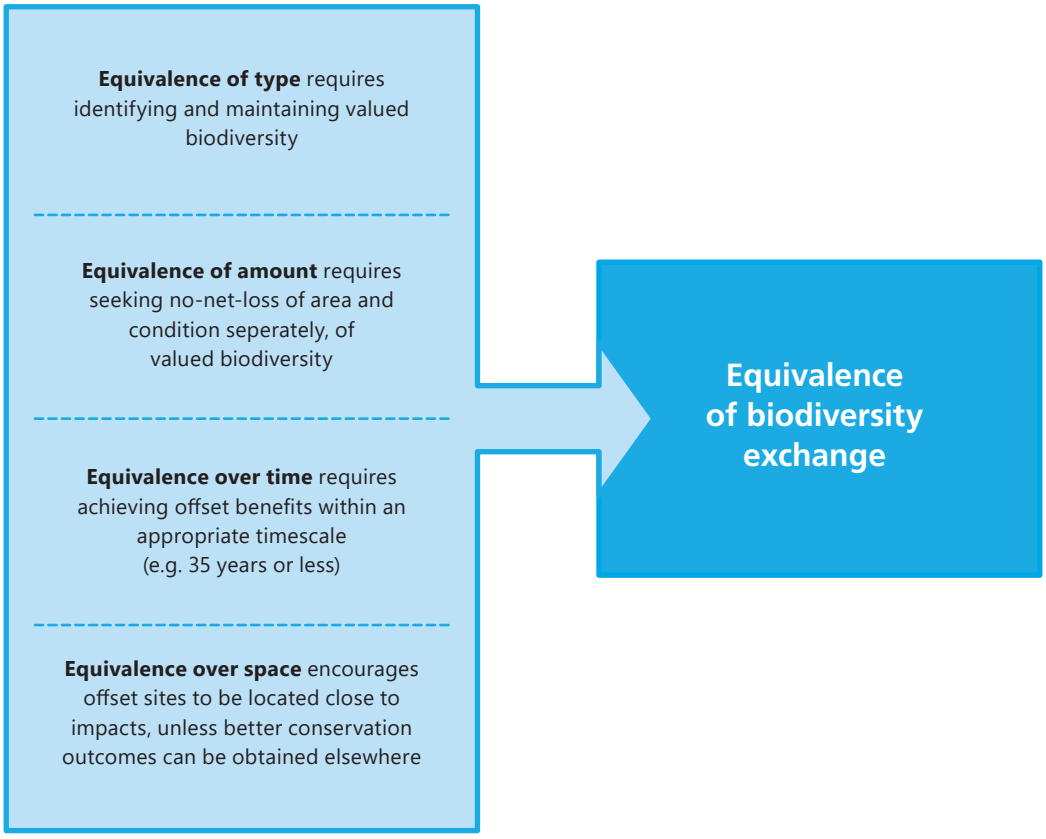


Figure 5: Factors contributing to equivalence of biodiversity exchange.

Evaluating ecological equivalence by type of biodiversity

Biodiversity is complex which means that detecting and measuring it in its entirety is not possible. Accordingly, designing a biodiversity offset typically involves the use of ecologically meaningful surrogates or measurements of a sub-set of all the biodiversity (species, habitats or ecological interactions) affected at an impact site. It is important that which elements of biodiversity (the 'type') for which no-net-loss is sought is explicitly stated, listed, and accounted for in a biodiversity exchange. Demonstrating ecological equivalence by type of biodiversity requires a like-for-like exchange. The only exception would be where a trading-up offset is sought. However, a trading-up offset still requires demonstrating ecological equivalence (the one is equal to the other), which will be increasingly difficult the more dissimilar (and less suitable for an out-of-kind exchange) the elements subject to the exchange are.

Biodiversity at a site that is not included in no-net-loss calculations may or may not be represented in trades, and may or may not be replaced at the offsite site to the same degree, and in fact may be permanently lost. A full picture should be presented to decision-makers and to avoid misrepresenting likely outcomes to stakeholders.

Using surrogates to describe biodiversity in offset proposals

It is realistic to expect that not all elements of biodiversity will be explicitly included in an offset model or calculation. For communities and ecosystems, key indicators for structure, function and diversity, including named species, are often used, rather than attempting to list and categorise all biodiversity present. How biodiversity is measured has a substantial influence on the outcome of the offset. Whenever surrogates are used their appropriateness to represent underlying biodiversity should be robustly supported.

For example, a comparison of modelling approaches was made for a quarry site near Auckland. One approach focussed on species composition and listed 220 species in the model to represent biodiversity values. The other approach listed 18 biodiversity components such as tier structure, bird guild presence, indigenous species dominance and richness, as well as indicators of ecosystem function such as kereru density, indices of stream health and presence of key forest and shrubland canopy species. The offset models created for each provided a similar outcome for offset site restoration, indicating that careful choice of biodiversity elements that include species, functions and structure can provide a robust representation of species and communities that are important to be replaced.

Evaluating ecological equivalence of biodiversity amount

The amount of biodiversity exchanged (for the elements of biodiversity subject to the offset) must be adequate to fully compensate for the biodiversity losses and achieve no-net-loss. Biodiversity offsets typically exchange a certain impact now for an uncertain gain in the future. This risk of failure of outcome and time-lag in achieving gains influences the amount of biodiversity gain required. 'Multipliers' or discount rates[3] must be incorporated into offset accounting systems to adjust (discount) the amount of gain estimated to be generated by an offset to account for these uncertainties.

Multipliers and discount rates remain subject to debate

The application of multipliers and discount rates to offsetting is poorly understood, but gradually evolving. Therefore, decisions regarding what size multiplier or discount rate to apply to an offset calculation should be carefully considered and use the best available information. The rationale used to decide which multipliers and discount rates to use within offset calculations should be provided alongside the offset calculations.

An element of objectivity may be introduced to the choice of discount rates by basing them on discount rates used elsewhere (e.g. financial markets, although it is recognised these discounts rates are unlikely to be ideal for biodiversity) to reflect preference for a benefit now over a more uncertain benefit in the future. An analysis of discount rates for use in offsetting projects in New Zealand provides some guidance.[4]

Equivalence in amount must be assessed for each type of biodiversity. Most developments will identify more than one type of biodiversity for which loss and gain should be separately assessed. Multiple sites may be necessary to adequately address impacts on particular habitats, species, or communities of interest.

(3) A multiplier is a factor used to adjust the size of the offset so that gains are greater than losses and are used to account for various factors including: risk of failure; uncertainty in offset action; imperfect exchange currencies; time-lags; biodiversity conservation objectives. A discount rate is a type of multiplier.

(4) Denne T, Bond-Smith S 2011. Discounting for biodiversity offsets. COVEC report prepared for the Department of Conservation. COVEC, Auckland, New Zealand.

Evaluating ecological equivalence across time

Evaluating the adequacy of an offset proposal that seeks to achieve no-net-loss requires a clear understanding of how long it is expected to take (the 'time horizon') to ecological equivalence. A time horizon of 35 years — often the duration of a consent — is commonly used when proposing offsetting activities under the RMA. It is reasonable to expect no-net-loss to be demonstrated within the life of a resource consent, although achieving no-net-loss earlier is preferable as it is often more cost effective for the applicant and provides greater certainty for the council and stakeholders.

In cases where an offset proposal cannot generate no-net-loss within the life of the consent but is defensibly predicted to at some point in the future, the proposal must demonstrate how certain the future gains are. This should include a monitoring programme, clear goals, and an adaptive management framework to ensure that long-term predictions are achieved. However, adaptive management should not be used to test unsubstantiated predictions (e.g. speculation on likely outcomes) – there must be an acceptable amount of certainty of success at the outset.

The importance of time horizons

The time it takes to generate biodiversity gains is an ecological impact in itself and can have significant social consequences. The longer it takes to achieve an equivalent replacement, the greater the gains generated by the offset need to be to compensate for the time-lag (delivering an offset sooner incurs a smaller multiplier).

Time-lags in generating gains can be significant. For example, the growth of forest habitat to replace one removed is theoretically possible, but in reality, this takes several generations. In the meantime, animals and plants are deprived of suitable habitat and communities cannot access those natural values either.

Time-lags can be so long as to render such actions unacceptable on ecological or social grounds and inadequate in the context of an RMA consent application. These cases are also illustrative of limits to offsetting.

It is also important to remember that the management required to maintain the offset gains over the long-term may be required beyond the time-point at which no-net-loss is demonstrated.

Case study

The importance of locking time horizons into consent conditions

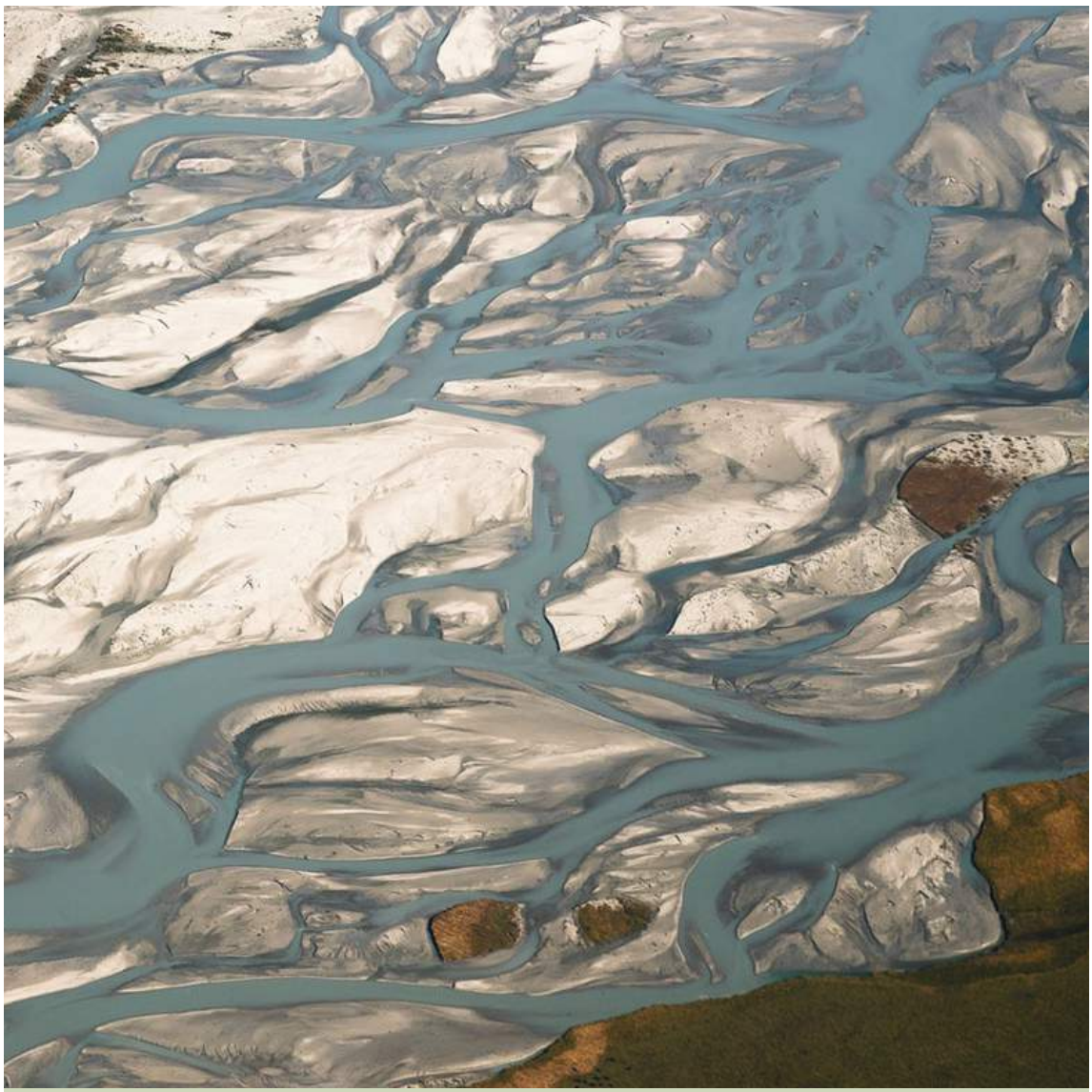
A major roading project in New Zealand recently proposed a well-modelled offset package based on a 35-year delivery frame, yet the consent conditions required management at the offset sites for only 10 years. Unless active management occurs for the full 35-year period, the actual biodiversity gains will likely be far less than the intended gains (at least 75% less), and the project will result in a clear net-loss of biodiversity values, rather than the proposed no-net-loss outcome.

Evaluating ecological equivalence across space

It is particularly important for maintaining indigenous biodiversity representation, extent, and pattern at a landscape level that the biodiversity gains should be generated near to the location of the losses. Proximity of offset to impact can also contribute to achieving equivalence in biodiversity type (e.g. locating the offset within the same ecological district or region) because similarity in biodiversity between different sites tends to decrease as the distance between them increases. There are also important social reasons for locating offsets as close to impacts as possible, including considerations of social equity and the flow of ecosystem services to local communities.

However, in some circumstances, spatially distant offsets may provide the best conservation outcome. For example:

- An offset carried out in proximity to the development may be vulnerable to further impacts from the development or ongoing activities associated with the development. For example, a stream-offset may be better placed in an adjacent catchment if future upstream development at the impact site is likely to affect achievable biodiversity outcomes; or
- Where actions that would most benefit the species of interest are most effectively implemented remotely from the impact site (see case study).



Case study

Spatially distant offsets can provide effective offsets for some species

A proposed wind farm development in the North Island was predicted to cause significant strike mortality on two national migrating wader birds (South Island pied oyster catcher and wrybill) as they flew through the wind farm on their migratory routes. Both these species breed in South Canterbury braided river habitats over summer and winter in North Island harbours and estuaries. It was determined by species experts that the action that would result in the greatest additional benefit for these species was to boost breeding success. This still represents a like-for-like exchange as the gains accrue to the same species that were predicted to suffer losses.

A proposal was developed which involved animal pest control at the species' breeding sites to boost fledging productivity as an offset for the predicted turbine strike mortality occurring over 1000 km to the north.

Chapter Four

Designing and implementing biodiversity offsets to achieve better biodiversity outcomes

This chapter covers practical aspects of offsetting and is likely to be of most interest to anyone involved in offset design, evaluation, and implementation.

This chapter:

- Provides and explains key steps in the design process for biodiversity offsets.
- Recommends that the level of proof required to support an offset proposal should be commensurate with the complexity of biodiversity being offset, its value, and the likelihood of success.
- Identifies practical actions that can be used to generate offset gains.
- Explains metrics, currencies, and accounting systems and their use in evaluating biodiversity offset proposals.
- Recommends that using currencies and models that disaggregate the biodiversity elements subject to the offset exchange are preferable to those that aggregate these measures into a single metric.
- Recommends transparent communication of model outputs as a fundamental step in engaging stakeholders and decision-makers.
- Recommends key components that should be integrated into the development of future tools designed to evaluate offset proposals.
- Suggests that council-driven development of future evaluation tools will be advantageous to equity and consistency in assessment across different projects and applicants.
- Recommends a set of principles for consent conditions to ensure biodiversity offset requirements are delivered as agreed.
- Emphasises the importance of robust monitoring and reporting frameworks supported by compliance and enforcement.
- Recommends that councils adequately resource monitoring of offset outcomes and compliance with offset conditions of consent, and adequately train staff for this purpose.

4.1 Designing biodiversity offsets

Achieving good outcomes when undertaking a biodiversity offset is more than merely producing a set of calculations that show that biodiversity losses at least equal gains. There are several important key steps along the design and implementation phases of offsetting that are arguably as, or more important, than showing no-net-loss on paper. These include steps to appropriately consider what the impacts are of a development, which of those impacts can be avoided or mitigated in the first instance, whether an impact can be offset, and how a programme of management actions will be implemented at an offset site to ensure effective and lasting biodiversity benefits of the nature and magnitude predicted. In this regard, the process for designing an offset has much in common with standard ecological impact assessments.

Additional guidance on the design of offsets can be found in the Good Practice Guidance document, and at http://www.doc.govt.nz/about-us/our-policies-and-plans/guidance-on-biodiversity-offsetting/

4.1.1 No-net-loss of what, compared to what?

The starting point for evaluating ecological equivalence is explicitly defining offsetting objectives within a clear frame of reference:

- **What.** Which elements of biodiversity are up for trade — what do we care about and where does the threshold of acceptable loss lie when there are differences of biological complexity and scale between a development and an offset site (no matter how similar the sites may appear). Determining the 'what' will be guided by existing policies (e.g. regional plans and national priorities) and through stakeholder input.
- **Compared to what.** The state and trends of biodiversity in the absence of both the impact and the offset (the 'baseline') provides a comparison and reference point for the change expected from an offset proposal. Throughout most of New Zealand, biodiversity is still declining, although determining the rate of decline can be difficult. However, the baseline must be described as accurately as possible to enable the calculation of gains and losses in real terms.

Most offset calculations in New Zealand assume a baseline that reflects a steady state into the future. This assumption reflects a precautionary approach that avoids the risk of overstating benefits at the offset site. Where declines are being reversed (e.g. by wider pest control initiatives) it will become more important to accurately assess long-term baseline trajectories.

Assumptions made about the background trends in relation to biodiversity can have significant implications for offset decision-making. Given the paucity of data available in New Zealand regarding the state and trend of biodiversity and the inherent difficulties in estimating future scenarios, it is likely that these assumptions will be based more on judgement than robust data. Therefore, as a precautionary approach to achieving sustainable management it is preferable to aim for a net-gain rather than a no-net-loss objective for offset projects. Even under a best-case scenario where all the assumptions were accurate and there is no failure, or part failure in the offset design and delivery, a no-net-loss offset would only achieve a neutral outcome at best.

Biodiversity offsetting requires expert input

Biodiversity offsetting is quite possibly the most complex, challenging, and contentious conservation intervention in common use, and it encompasses multiple dimensions including technical, social, ethical, cultural, and governance aspects.

As is common practice for other disciplines (e.g. engineering, water allocation, etc.), the need for the relevant technical expertise must be recognised by applicants and consenting authorities. Experts should be involved at all stages of the offset design, evaluation, implementation, and monitoring stages.

4.1.2 What are the key steps in the design process for biodiversity offsets?

The generic process is shown in Figure 6 with reference to the information requirements and key considerations that should be applied at each step, and reference to relevant parts of the RMA process, including outputs that an auditor, reviewer or consent officer could expect.

STEP	INFORMATION NEEDED	OUTPUTS	RMA
1. Identify actual or potential adverse effects	Assess ecological effects Identify key effects and biodiversity values Engage and consult with stakeholders	Schedule of biodiversity values directly or indirectly affected	Pre-application discussions s.88 Schedule 4 effects assessment Non-statutory offset guidance
2. Apply the mitigation hierarchy	Explore and document ideas to avoid, remedy and mitigate adverse effects	Proposed avoidance, remediation and mitigation	Pre-application discussions Non-statutory offset guidance
3. Identify residual adverse effects	Determine the need for an offset based on residual adverse effects Relate the ecological significance of effects to RMA requirements	Assessment of residual effects against ecological significance criteria and need for offsetting or compensation	Pre-application discussions Part 2 s.6(c) Non-statutory offset guidance
4. Assess offset appropriateness	Confirm if adverse effects can be offset Demonstrate how offsets principles have been addressed Identify effects where re-design or compensation will be proposed	Schedule biodiversity that can and cannot be offset	Pre-application discussions Non-statutory offset guidance
5. Feasibility analysis	Confirm when effects are needed to be offset Confirm feasibility and appropriateness of offsets proposed	Describe management actions and how outcomes can be assured	
6. Calculate losses and gains and offset prescription	Confirm methods for calculating no-net-loss/ net-gain Select appropriate offset locations and management actions Calculate offset gains and losses	No-net-loss calculations and description of the offset and location(s)	

STEP	INFORMATION NEEDED	OUTPUTS	RMA
7. Record the offset design	Record the detailed offset specification Ensure compliance with plan/consent conditions	Offset proposal and monitoring plan	
8. Resource consent	Resource consent application	Ecological enhancement and monitoring plan Any measure proposed or agreed by the applicant to ensure positive effects to offset or compensate adverse effects. Resource consent decision	s.104 Note: The new RMA amendment includes s.104(1)(ab) s.108
9. Implementation and monitoring	Putting the offsetting plan into effect Monitor to confirm targets and thresholds are met and any adaptive management plan triggers Reporting results to council	Meeting resource consent conditions Adaptive management	Part 12 Enforcement provisions

Figure 6: Key steps and information needs as part of the offset design process. These steps will likely be iterative, particularly where the project footprint is refined or re-designed in response to ecological risks or ongoing stakeholder engagement.

Step 1: Identify biodiversity values and any actual or potential adverse effects on those values

An assessment of ecological effects (EcIA) is an integral part of the preparation of an Assessment of Environmental Effects supporting an application under the RMA and other legislation. An EcIA follows a specific process and provides robust assurance that the actual or potential effects of a project have been identified.(1) Undertaking these steps in a thorough manner will ensure that important biodiversity that is likely to be impacted by the project is identified and brought into the offset consideration.

Step 2: Application of the effects management hierarchy

Avoiding or minimising adverse effects provides greater certainty that biodiversity values will persist despite project development. This is because it is easier and more certain to retain biodiversity than to attempt to recreate biodiversity values elsewhere through an offset.

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

(1) One approach to assessing the scale of ecological effects from a development, and the significance of those effects in relation to the RMA is provided in the EIANZ impact assessment guidelines. These provide a robust, objective approach to narrowing ecological issues to those that are relevant to consider under legislation. The EIANZ EcIA approach is a useful tool to scope and define the importance of residual, adverse effects as a first step to assessing offset need.

Step 3: Identification of residual effects that are ecologically significant

It is important that Step 3 occurs after avoid, remedy and mitigate have been applied.

This guidance recognises two situations where residual effects trigger the need for a biodiversity offset to be applied (see Chapter Two):

1. Where a site is scheduled in a Plan as being ecologically significant, or is determined to meet significance criteria, a residual, adverse effect that is reasonably measurable triggers the need to consider an offset.

2. Where a site is not determined to be significant in terms of RMA s6(c), a residual, adverse effect that is significant triggers the need to consider an offset.

The EIANZ EcIA guidance includes an approach for evaluating the ecological significance of effects, based on the value of the biodiversity resource and the magnitude of effect, which can be incorporated into an offsets assessment.

Step 4: Ability to offset (offsetability) analysis

There are strategic as well as operational advantages to knowing when a biodiversity offset may not be appropriate, or when a high level of proof is required to demonstrate that a successful offset is likely. An international framework for assessing offsetability[(2)] provides a useful high-level assessment tool. It uses information about the value of the biodiversity affected, the magnitude of effect, the opportunity to offset at another suitable offset site, and the feasibility of delivering the offset to determine an appropriate level of proof that a successful offset outcome is likely. Examples of the level of proof required to support proposed offsets are provided in Table 3.

When should the limits to offsetting be assessed?

There is considerable benefit in starting the process early by undertaking an initial assessment of limits to offsetting during the preliminary design phase of a project (i.e. before an application is submitted to a council). 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, including because of the approach outlined to biodiversity management in the relevant statutory plan. Councils commonly run pre-application processes to enable such considerations to be addressed early in a development process.

(2) Pilgrim et al. 2013. A process for assessing the offsetability of biodiversity impacts. Conservation Letters 6:5 September 2013. http://www.doc.govt.nz/documents/our-work/biodiversity-offsets/pilgrim-et-al-2013.pdf

Table 3: Examples of the level of proof that may be required to support proposed offsets. These are examples only and illustrate how to determine level of proof required to support a proposed offset; they are not 'rules'. For example, regenerating shrubland might have a different level of conservation concern in different ecological regions of New Zealand.

Biodiversity component affected	Conservation concern for biodiversity affected	Offset feasibility (likelihood of offset success)	Level of proof required to support a proposed offset (offsetability)
Regenerating indigenous shrubland where the successional endpoint is a common forest type	Low, as the community is widely distributed and the impacted area is comparatively small.	High, as many offset sites are available and revegetation techniques are well understood with high success.	Low (balance of probability of proof).
Lowland coastal broadleaved forest	Moderate, as the community is reduced in extent and is patchy, although the impacted area is comparatively small.	Moderate, as many offset sites are available and revegetation techniques are well understood to establish early-stage forest.	Reasonable (a clear and convincing standard of evidence).
Fernbird population	High, as the species is declining across its range, the development will affect one of few viable populations, and any effects on local populations have national significance.	Moderate, as many offset sites are available and the benefits of planting and pest control for fernbird viability are reasonably well understood and outcomes predictable.	High (beyond reasonable doubt).
River gorge boulder turf communities	Moderate, as the community is not declining or threatened, although it contains plant species that are locally uncommon.	Low, as there are no examples of successful transplantation or of the technical knowledge needed to restore elsewhere.	An offset is unlikely to be technically achievable.
Only known location of a threatened land snail	Very high, as this is the only known population of the species and the development will remove its entire known habitat.	Low as there are no successful examples of translocation, habitat requirements are poorly understood, and translocation success is likely to be low and high risk.	An offset is unlikely to be appropriate or achievable.

What level of proof that an offset will be successful is required?

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 more complex or where management techniques are less well developed, a higher burden of proof should be demonstrated.

The factors that contribute to the level of proof include:

- the level of conservation concern (largely a product of the conservation threat classification and magnitude of effect on the population/ecosystem etc. arising from the development), and
- the likelihood of offset success (a product of the availability of offset sites at which to undertake restorative works, the level of confidence that offset actions will generate lasting benefits, and the availability of financial, social and technical support to implement the offset).

Step 5: Feasibility options analysis

This step comprises two parts. The first is an assessment of whether there is at least one management solution for the biodiversity values affected and which accords with the six offset principles (see Chapter One). In part, this relies upon the experience of the offset practitioner with similar projects to first estimate a coarse 'offset quantum' (prior to working through Step 6 (below)).

The second part is to consider the cost (and availability) of various options to achieve offset solutions. An available offset area and design should be proposed that addresses all necessary biodiversity impacts. During the offset design phase, it may be decided that seeking to achieve a no-net-loss offset across all individual biodiversity values for the particular project may not be possible for the overall project.

Where anticipated gains in biodiversity values from proposed offset actions are estimated to fall-short of a no-net-loss objective, the applicant should consider obtaining a greater offset area, adopting additional offset sites or actions for specific biodiversity values, re-assessing the project footprint, developing a compensation package to address effects that are not fully offset, or a combination of these actions. Additionally, a decision could be made not to proceed because the effects are too great.

Step 6: Calculation of losses, gains, and offset requirements

The fundamental basis of offsetting is the demonstration that no-net-loss can be achieved by quantification and exchange of biodiversity through an accounting model, such that an outcome that benefits biodiversity is achievable. Offset models should:

- Include indicators and specific measures of biodiversity that adequately represent the breadth and quality of biodiversity at both the impact and offset sites;
- Ensure that the complexity of the model reflects the complexity and conservation importance of the biodiversity matters arising from the development;
- Include the spatial area and quality of biodiversity at the impact and offset sites, as well as any time lag for delivery, risk of failure and uncertainty of outcome for the replacement of impacted biodiversity;
- Aim to replace the area affected as well as the quality of biodiversity affected, which may involve undertaking habitat creation as well as pest control, enrichment planting, stream rehabilitation or other forms of habitat improvement;
- Locate biodiversity enhancements at places where added benefits accrue, such as buffering adjacent conservation areas, linking existing habitat patches, or providing ecosystem services; and
- Contribute to local conservation efforts and acknowledge the conservation priorities of local stakeholders.

As with other types of models that forecast estimates of change, communication of the results of offset calculations or models is key to engaging stakeholders, councils and decision-makers. Ideally, model results need to be conveyed to end-users so that they can be clearly understood and the consequences easily interpreted. This is more easily achieved when stakeholders are included in the process at an early stage providing the opportunity for the basis for the offset model to be discussed and understood from the outset.

See also: THIS CHAPTER: Evaluation tools

Step 7: Recording the offset design

The specification for a proposed biodiversity offset includes a description of the offset need, the offset calculation basis, and offset locations and management activities. This information is necessary to provide transparency, and ensure that the offset outcomes can be monitored using the same methods utilised in the design of the offset. This usually forms the basis of a Biodiversity Offset Management Plan (usually called an Ecological Enhancement and Monitoring Plan (EEMP) in New Zealand). It should also contain information relating to non-offsetable effects, and any environmental compensation that is offered as part of a broader package of environmental enhancements, although this information should be presented in a separate section of the document for clarity. Because a EEMP usually contains multiple management actions and goals, it can be useful to present a separate biodiversity offset management plan to maintain transparency.

As well as the technical detail of the offset, the EEMP should also include a description of the roles and responsibilities of those carrying out the offset, and the governance and management structures relating to the operation of the offset. Specific considerations for securing the gains delivered by an offset include:

- Identification of the offset site(s) and securing the ability to undertake offset works within those by way of landowner agreements (e.g. covenants) or acquisitions;
- Inclusion of the financial costs of offset site management into bond calculations or other similar instruments as required by councils that secure financial delivery of offset benefits;
- Development of an offset monitoring programme to assess the degree to which offset targets are being achieved, and to maintain or adjust biodiversity management on the ground to ensure that gains are achieved and maintained for the long term; and
- Establishment of a programme of reporting the results of monitoring results and a process for undertaking actions if offset targets are not being achieved as anticipated. The reporting programme may comprise elements of either a reporting standard on biodiversity offsetting or requirements as laid out in conditions of resource consent (or both).

The EEMP can be used within a consenting process so that the offset design is captured within the conditions of consent.

Step 8: Incorporate offset into resource consent

The application of the EEMP in practice requires that the offset be managed and monitored in accordance with the agreed set of success criteria that should be clearly detailed in conditions of consent. Important components of the consent conditions include:

- A requirement for appropriate legal protection of the offset site(s);
- Clear articulation and understanding of the management targets and standards that must be undertaken in order to meet the success criteria on which the anticipated biodiversity gains are predicated;
- A monitoring programme that includes trigger thresholds (e.g. sub-optimal pest kill rates) which require discussion with the council as to the management methods used, and adaptive management responses to improve success; and
- A reporting process through which the consent holder is required to report sub-optimal performances, and through which the council, in conjunction with the consent holder, may seek alternatives to the existing management to improve performance in the protection, restoration or enhancement of the target biodiversity.

Step 9: Implementation and monitoring

Successful implementation requires a commitment from both the applicant and the consenting authority. Critical requirements include:

- Adherence to monitoring and reporting requirements detailed in the consent;
- Integrity in the reporting on the condition and success of the offset;
- A robust compliance regime which ensures any issues are effectively addressed; and
- Clear and accessible record keeping to ensure the offset is managed and 'visible' over the required timeframes and so the project monitoring can contribute to an understanding of the cumulative scale and effect of the offset.

4.1.3 What practical actions can be used to generate offset gains?

Offset gains can be secured via a number of management actions that are designed to halt biodiversity losses and maintain or enhance biodiversity values (i.e. restoration, rehabilitation, enhancement, or protection of biodiversity on the landscape). The pool of management opportunities able to be used for generating offset gains is limited only by the requirements that the management actions proposed have at least a reasonable probability of success, and that offset benefits are measurable.

If management actions are novel, untested or have a considerable risk of failure, or if benefits to the species or community of concern are not measurable, the core principle of offsetting — being that biodiversity can be measured and exchanged to demonstrate no-net-loss — cannot be met, and an offset is not feasible. It is important to understand the breadth of management actions that can result in benefits to biodiversity because these are the foundation for gains promised and predicted from the offset calculations.

In New Zealand, there are typically three broad groupings of management that can provide offset benefits under either of these two types of offsets (Table 4; Figure 8).

Table 4: Examples of the three broad groupings of management actions that can provide offset benefits.

Type of biodiversity offset	Type of management action	Examples of application in New Zealand
Averted loss offset Prevent future loss of biodiversity that would occur if it were not for the management action so that the current extent and condition of biodiversity is maintained	• Permanent protection of habitat that is at risk of being destroyed	• The retirement of resource consents or other permits that allow indigenous vegetation clearance that were likely to be initiated. • Placing Open Space or other covenants on habitat in a location or of a type that can be shown to be at a credible risk of removal or substantial loss through development actions, and is already protected in some form (e.g. S6c of the RMA), or where any future clearance of the area would itself trigger the need for a resource consent and possible offset. • The protection of such areas generates large potential gains immediately as the baseline against which gains are measured is zero if the site was likely to be totally cleared in the future. A key consideration for averted loss offsets is demonstrating that the potential losses being averted are credible (i.e. that the proposed offset site actually was at risk of loss in the reasonably foreseeable future) and that the gains meet the definition of additionality.
Biodiversity improvement offsets Achieve gains of a magnitude sufficient to shift the background biodiversity trend to achieve recovery or improvement in extent and condition of biodiversity	• Restoration actions including habitat or population creation within where that habitat or species is no longer present	• Planting of bare land to create early successional native forest • Removal of threats to allow natural establishment of wetlands or dunelands • Day-lighting of streams to restore function and biodiversity values • Creation of engineered habitat within streams for native fish • Removal of barriers to fish passage such that upstream reaches become accessible as viable habitat for native fish • Translocation of animals or plants and establishment of a new population in an area where they were once present, but have become locally extinct • Site or ecosystem- appropriate plantings may be used to offset loss of vegetation types or loss of habitat for specific species. Where species offsets are the focus, a revegetation and management programme tailored to that species may be required.
	• Enhancement actions to increase the value of existing biodiversity and remove threats to species populations such that declining trends are reversed • Enhancement actions typically require less capital to set up than restoration actions, however ongoing investment can be substantial and over a long timeframe (which can be in perpetuity or at least for a long period).	• Targeted pest animal control tied to specific objectives • Targeted control or management of ecologically damaging weed species • Fencing to prevent access by stock to wetlands or forest • Replanting of stream riparian margins • Removal of artificial ponds from the streambed of natural waterways • Enrichment planting to improve plant species diversity, accelerate succession or fill canopy gaps • Where pest animal control is proposed, the offset benefit will be different for single-species compared to multi-species or guild (herbivores or predators) pest control. Where pest eradication is proposed (for example within fenced sanctuaries) far greater offset benefit may be generated.

Native revegetation

Advantages

- Replaces physical extent of habitat lost.
- Biodiversity gain becomes self-perpetuating over time after plants establish.
- Maintenance costs are generally lower than for pest animal and weed control.

Disadvantages

- High captial cost to establish plants.
- Biodiversity benefits accrue slowly.
- Requires change of land use.

Pest animal and weed control

Advantages

- Improves quality of an existing biodiversity asset.
- Biodiversity gains can accrue quickly.
- Uses existing land use.

Disadvantages

- Ongoing management inputs required to sustain biodiversity gains.
- Requires long-term funding commitment.

Figure 8: The relative merits of native revegetation (a restoration action) compared to pest animal and weed control (an enhancement action) at generating biodiversity benefits as offsets.

Using management actions to offset both extent and condition of biodiversity

Enhancement offsets on their own do not replace the extent of habitat lost but can be used in conjunction with restoration offsets and averted loss offsets to provide an offset package that replaces lost habitat and, where appropriate, enhances existing habitat to generate biodiversity gains.

When choosing between options that generate a similar type and magnitude of offset benefit, there are several considerations of good offset design that sit outside models and calculations. These include:

- Understanding conservation priorities in the broader local area or region where offset areas needed for one project could contribute to local government, community or other agency biodiversity management projects.
- Looking for opportunities to link habitats, create habitat corridors, build ecological buffers and connect ecological sequences so that the benefits of the offset also extend to restoring ecological functions and processes at a broader spatial scale.
- Considering where there are relatively higher conservation benefits to be gained by opting for a trading-up offset or locating an offset further away from the impact site, compared with conventional approaches.

4.1.4 How can offset gains be secured?

Research across New Zealand development projects demonstrates that overall, there is a poor record of implementing conditions of consent requiring ecological offset or compensation works.[3] Even if implementation is undertaken to establish an offset, securing any long-term gains through maintenance and management of the offset relies on robust, enforceable arrangements confirmed at the outset.

Mechanisms that aid the long-term securing of biodiversity gains at a site are mentioned throughout other sections of this guide, and include:

- Early, ongoing and detailed engagement, as this is key for an effective relationship between the council, applicant, and stakeholders;
- Placing of permanent protection covenants over offset sites;
- Ensuring that consent conditions stipulate the management activities that can and cannot happen within the offset site, and include ongoing monitoring and reporting of offset site condition and compliance with consent conditions;
- Ensure that governance of the offset is clearly laid out and adhered to; and
- Where applicable, include financial bonds that cover the cost of undertaking offset management.

(3) Brown MA, Clarkson BD, Barton BJ, Joshi C 2013. Ecological compensation: an evaluation of regulatory compliance in New Zealand. Impact Assessment and Project Appraisal: 31(1):34–44.

4.2 Evaluation tools

4.2.1 What does a good biodiversity offset accounting model look like?

Demonstrating ecological equivalence requires quantitative analysis of biodiversity losses and gains within an objective and repeatable framework. Biodiversity offset accounting models are used to achieve this and have several key components (Table 5).

The biodiversity offset accounting model used influences the size of the offset required

The choice of metric, currency, and accounting system used in offsetting models substantially influences the outcome, and need to be chosen and applied with care. Currently, there is no universally accepted offset model in New Zealand. Overseas, offset models are ether stipulated by legislation (e.g. the Australian Federal Government's offsets policy), a range of options provided (e.g. BBOP technical guidance), or guidance given on look-up tables that summarise multipliers for habitat types (e.g. UK offset scheme).

In New Zealand, offset models have generally only been used for large developments (e.g. wind farms, dams and mines) where biodiversity matters are broad-ranging and offset models are correspondingly complex. The disaggregated condition-area model developed for the Department of Conservation[4] provides a more accessible, transparent, and structured means of assessing an offset proposal than those previously used in New Zealand. Whichever accounting model is used, the metrics, currencies, and accounting system should be chosen with full consideration of the recommended characteristics provided here and their use communicated transparently.

Where subjective decisions and assessments cannot be avoided, it is important to acknowledge and document any uncertainty associated with these decisions and assessments, and the effects of this uncertainty on the level of confidence in model outputs.

(4) Maseyk FJF, Barea L, Stephens RTT, Possingham HP, Dutson G, Maron M. 2016. A disaggregated biodiversity offset accounting model to improve estimation of ecological equivalency and no net loss. Biological Conservation 204:322–332.

Table 5: Key components of a biodiversity offsetting accounting model.

Component of an offset accounting model	Explanation	Ideal characteristics
Measures and metrics	• The elements of biodiversity subject to the exchange, are described and measured both at the impact site and at the offset site, using measures and metrics that allow effects to be quantified in standard biodiversity units. This might be (for example): • Percentage cover of canopy species. • Measures of tree stem diameters. • Number of adult individuals. • Estimation of fauna population size. • Number of breeding pairs. • The value of each measure is typically compared to a benchmark value relevant to the biodiversity element being measured (described by a common metric).	• Are fit for purpose to fully describe and measure all elements of biodiversity for which no-net-loss is sought. • The same measures and metrics are used for the same elements of biodiversity at both the impact and offset site.
Currencies	• A currency uses the metrics to create a common value that describes how much of what is exchanged in a biodiversity offset trade. The use of currencies allows a common value to be generated to describe the state of biodiversity at both the impact and offset sites and to compare the difference. Currencies can either aggregate measures of biodiversity into a composite unit or individually account for each measured biodiversity of interest in a more disaggregated manner. Any element of biodiversity that a currency does not explicitly account for is either lost in the trade, or exchanged by default. These are known as concealed trades. The choice of currency has a substantial influence on the outcome for biodiversity. More aggregated currencies increase the number of concealed trades compared to more disaggregated currencies.	• Does not aggregate above the level of interest for which no-net-loss is sought. • Does not aggregate across types of biodiversity, and should ensure that species or communities of interest are treated separately in the loss-gain calculation.
Accounting system	• An accounting system is a mathematical framework used to compare the currencies representing the value of biodiversity lost at the impact site (biodiversity value post-impact minus biodiversity value pre-impact) with the predicted value of biodiversity gained at the offset site (biodiversity value post-offset minus biodiversity value pre-offset). • The output of the accounting system or model is an indication of whether no-net-loss has been demonstrated, and an estimate of the area and biodiversity elements that need to be managed under a given management regime, and for stated period of time, which is likely to provide biodiversity gains that fully balance the predicted losses at the development site.	• Accounts for uncertainty in an explicit way. • Incorporates time-discounting to account for delay between impacts and offsets. • Supported with justification for multipliers used to adjust the size of offset required. • Fit for purpose and relative to the scale and importance of the biodiversity impacted. • Accounts for the full and relevant spectrum of biodiversity values of concern. • Transparent and accessible by stakeholders and decision makers and avoid 'black box' equations. • Usability does not compromise the ecological robustness of the model.

Biodiversity offsetting accounting models are not decision-making tools

Biodiversity offsetting accounting models should be viewed as a decision-support tool and not a decision-making tool. Further evaluation of the project as a whole will be required.

Accounting models are necessary to gauge whether an offset proposal can achieve ecological equivalence and provide an indication of the magnitude of offset effort that is required to achieve ecological equivalence. This is often an iterative process with several project and offset proposals compared to each other to find the best outcome. Other processes will usually need to be conducted in conjunction with the accounting model, for example a spatial analysis to select suitable offset sites.

4.2.2 Why is it important to avoid highly aggregated currencies?

All currencies aggregate biodiversity to some level, but it is important that currencies do not aggregate elements of biodiversity for which no-net-loss is sought into a single metric. Avoiding this aggregation allows for each component of biodiversity for which no-net-loss is sought must to be assessed as having maintained, gained, or lost area or condition (or both) between the loss at the development site, and any gains that may arise from managing biodiversity at the offset site. More disaggregated currencies should be used where ever possible, to avoid issues of surrogate measures (relying on one measure of biodiversity to account for a different element of biodiversity), concealed trades (exchanges of biodiversity that are not explicitly accounted for), and unintended substitution of biodiversity during the process of selecting and assessing the appropriateness of an offset site (Table 6).

For example, an offset model that measures forest biodiversity values by (for example) including birds, vegetation, guilds, threatened species, and important communities has a good chance of having these characteristics replicated at an offset site if each is reported against the no-net-loss objective. The likelihood that each biodiversity component will be replaced to a no-net-loss (or net-gain) level is reduced if all individual scores are aggregated into one overall forest health score that is then used as the basis for site selection and management at an offset site.

Table 6: Key characteristics of currencies used to evaluate biodiversity offset proposals related to the degree of aggregation within the currency.[5]

CHARACTERISTIC	MORE AGGREGATED	MORE DISAGGREGATED
Measure of biodiversity elements of concern	Composite or surrogate measure to describe many elements e.g. habitat quality metric for an area of vegetation.	Many and/or direct measures of all biodiversity elements of interest e.g. individual measures of composition and structure of biota in vegetation type.
Risk of concealed trades	Higher	Lower (occurs only below level of disaggregation) or for what was excluded from consideration in the trade.
Ability to substitute biodiversity elements	Higher	Lower (occurs only below level of disaggregation)
Transparency of what is being traded (ability to evaluate offset proposal, and to track performance of offset action)	Less transparent	More transparent
Ability to find potential offset sites	Wider (easier to find a match of a composite measure of biodiversity)	Narrower (more difficult to find a match across multiple elements of biodiversity, may require multiple offset sites)

(5) Adapted from Maseyk FJF, Barea L, Stephens RTT, Possingham HP, Dutson G, Maron M. 2016. A disaggregated biodiversity offset accounting model to improve estimation of ecological equivalency and no net loss. Biological Conservation 204:322–332.

4.2.3 Why is it important to clearly communicate offset calculations and forecast outcomes?

Offset calculations forecast the condition of biodiversity over increments of time. The time series produced for the effects at the impact site and the benefits at the offset site can be tabulated or illustratively presented to display predicted change over time. The sum of losses and benefits at each site for a type of biodiversity can be shown as the combined output to provide insight into when, how close and what factors might affect the ability of an offset project to meet a no-net-loss objective (Figure 9).

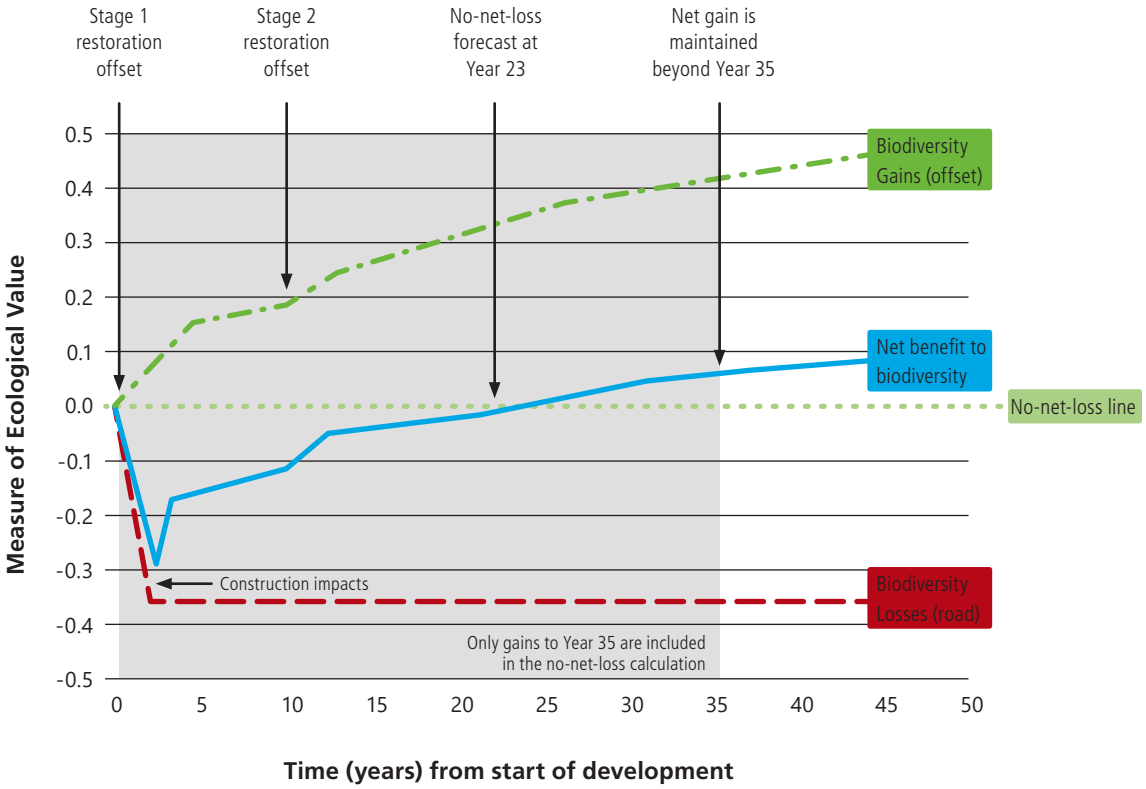


Figure 9: A representation of an offset model's outputs, showing the step-wise, forecast loss of biodiversity values from the staged development of a project, and the predicted accrual of biodiversity gains at the offset site (in this case from planting and pest control at two sites). The net overall effect is one of no-net-loss after approximately 23 years. The net benefit settles to a long-term net-gain of biodiversity values as a result of the project.

4.2.4 Can the Stream Ecological Valuation (SEV) methodology be used to estimate a biodiversity offset requirement?

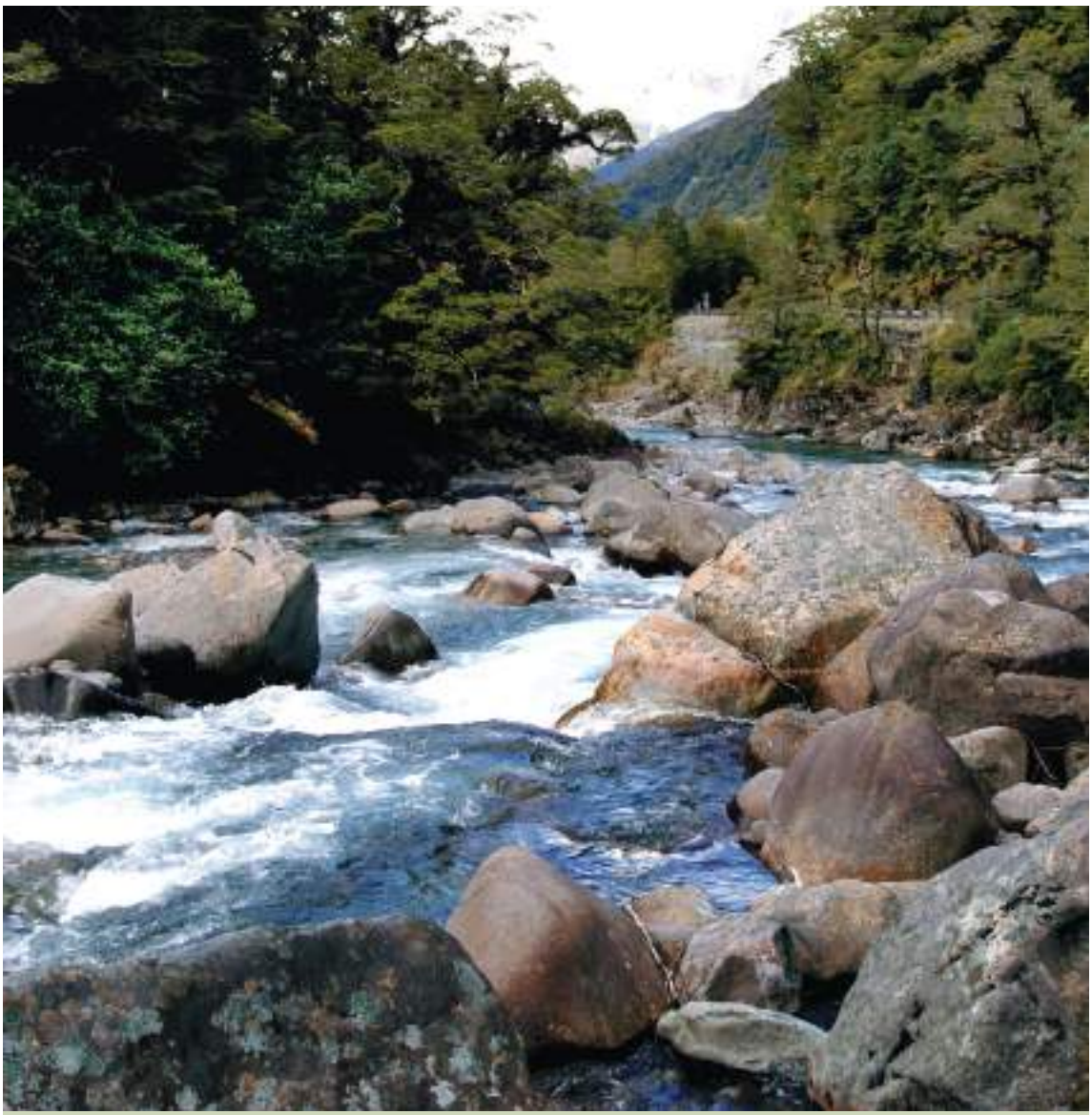
The Stream Ecological Valuation (SEV) methodology was originally designed to determine the value of Auckland urban streams, but is now being applied by many other regional councils to evaluate effects management proposals associated with impacts of modifying streams. Given that the SEV methodology is well established in the resource consenting process, it is necessary to consider whether the SEV methodology should be recommended as a tool to evaluate proposals designed to offset losses of stream values.

The SEV methodology is used to determine the ecological functioning or ecological value of a waterway. The SEV scores calculated from the field assessment are used to estimate and quantify the amount of offset required to balance the stream loss or modification to a no-net-loss (NNL) outcome. The area of stream required to be restored to achieve NNL is calculated by way of an 'environmental compensation ratio' (ECR). The results of an SEV analysis can be used to calculate the amount of 'environmental compensation' required to account for stream loss. The SEV provides a standardised approach to assessing loses and gains of stream values that has improved effects management practice in recent years. The environmental compensation approach adopted for the SEV methodology is largely compatible with biodiversity offset principles. For example:

- **No-net-loss and preferably net-gain**. The SEV emphasises achieving no-net-loss of overall ecological function, rather than focusing directly on the biodiversity values.
- **Ecological equivalence of type.** The preference for SEV offsetting is to recreate 'like-for-like' habitat, to help guard against the cumulative loss of stream types at a catchment scale.
- **Ecological equivalence across space.** While on-site offsetting is preferred, the SEV approach allows for off-site selection where on-site offsetting is not possible.
- **Mitigation hierarchy.** Applying ECR to offset the loss of stream habitat is not the default 'go to' step when mitigating for loss or modification of instream ecological values. The ECR is intended to only be adopted to compensate for any residual adverse effects when avoid, remedy, and mitigation options have already been applied. Further, the authors of the SEV methodology emphasise the assumption that a full assessment of a site has been conducted as per the RMA process.

The SEV methodology has been applied in New Zealand, predominantly in the Auckland and Wellington regions for approximately 11 years. It is also being adopted, on an ad hoc basis, in other regions around New Zealand. For the most part, the SEV methodology is a robust and effective tool to support decisions on suitable offset packages for the modification or loss of freshwater stream habitats. The SEV methodology has produced successful outcomes and given certainty to regulators and applicants alike. The key strengths of the SEV methodology are summarised below:

- The underlying rationale and methodology of measuring stream values using the SEV is robust.
- It takes an ecological function approach to assessing stream values, instead of only focussing on the biological components. Therefore, the breadth of coverage of variables that describe stream 'value' are well covered and included in the SEV exchange model.
- It provides a consistent, standardised approach across projects for considering the values affected and how to manage loss for streams.
- The focus on a quantitative foundation forces users to think critically about stream values and to provide a robust rationale for their choice of values that comprise stream state and condition.
- The method is relatively simple to use, with some training.



Case study

How the SEV can help encourage the avoidance of effects

An original plan for a subdivision involved the establishment of 32 residential lots over the site. The proposal involved the infilling of part of a gully system and subsequent loss of a 106 metres of stream length, equating to 47 m2 of stream area. Using the SEV model, the environmental compensation ratio determined that 726 m2 of relatively high-quality stream area needed to be restored from an existing lower quality stream habitat to compensate for the loss of 47 m2 of impacted stream. Allowing for a 5 m wide riparian buffer on each side of the stream an area 4840 m2 of stream side vegetation would need to be rehabilitated. As a consequence, the developer agreed to yield a potential residential lot where an unaffected but degraded, part of the same stream and gully could be reserved and restored to achieve the offset area determined by the SEV analysis.

However, there are aspects of the SEV methodology and its current application that make parts of its application inconsistent with good practice biodiversity offsetting and environmental compensation as described in this document. These are mostly technical matters that arise from how the SEV treats the current state of the environment, how it communicates an overall score representing the 'value' of a stream, and how the ECR calculation adds multipliers to address time lags, risk, and uncertainty in the delivery of stream ecological benefits. These matters can compromise the SEV's intended purpose as a tool for achieving no-net-loss.

The SEV methodology should not be seen as a 'tick-box-one-stop' approach to achieving a satisfactory biodiversity offset

Like any evaluation tool, algorithms and default indices cannot provide an absolute output, and professional judgment is still required to determine the final solution. Invariably each application of the SEV methodology is different, and has competing objectives or site-specific variances and intricacies to the assumed model parameters, which will often require judgement calls and other steps to secure a robust and equitable offset package. This is particularly necessary at the most important step — determining a suitable offset site and understanding the spatial and temporal dynamics of an ecological restoration process to measure the likelihood of success and long-term viability and security of that offset.

4.3 Achieving better implementation of biodiversity offsets through the consenting process

4.3.1 What is needed to improve current practices?

There is no recognised standard for undertaking biodiversity offsetting in New Zealand. Standards, where they are proposed, may also not have the benefit of extensive application needed to test them for unintended outcomes or needed improvements. This is particularly relevant where the technical application of offsetting is embedded within a statutory and planning context (as it is under the RMA) and where implementation and management of offsets may lack sufficient support to ensure effective delivery of the promised biodiversity benefits.

Principles for consent conditions

Consent conditions are pivotal in ensuring that biodiversity offset requirements are delivered in the manner agreed. They are particularly important where enforcement action is needed to compel the implementation of offset conditions, to establish what exactly is legally required. The principles of good offset conditions are similar to the principles for all good consent conditions — all seek to ensure an outcome occurs as agreed. Good quality conditions ensure the following:

- The requirements are clear to the applicant, the council, and any other interested party (including the general public).
- That a clear determination can be made of whether or not the applicant is in compliance.
- That where non-achievement — including due to non-compliance — is noted, enforcement action is not undermined by ambiguous conditions.
- In addition to general quality control of conditions and ensuring they remain within the legal reach of the council, good offset-related conditions should be SMART (Specific; Measurable; Achievable; Realistic; and Time-bound).

Biodiversity offset conditions often require specific elements to effectively secure outcomes and provide for effective implementation. Some examples include:

Flexible conditions. The use of adaptive management approaches is particularly important for offset projects. These approaches enable inputs and monitoring to be adjusted to reflect changes in the environment, the incorporation of new methods, and responses to unexpected trajectories and outcomes. Such flexibility is important to avoiding 'locking-in' requirements that prove to be inefficient or ineffective. Where flexibility is provided however, the overall outcomes should remain secure and triggers for further consents or other actions clearly identified.

Detailed management plan/s. The complexity of offsetting demands careful planning and a large amount of information that may be too complex or lengthy for consent conditions. In these situations, consent conditions should clearly refer to a biodiversity offset management plan (e.g. an Ecological Enhancement and Monitoring Plan) and the need for its implementation. Consent conditions should also contain key milestones to be achieved and their timeframes, which should align with those in the management plan.

Bonds and other security arrangements. Offset requirements are often subject to bonding under the RMA and other strategies to ensure that (a) the applicant carries out agreed actions or that (b) in the event they do not, another party — usually the council — has the means to do so. Conditions should clearly state what these financial arrangements are, and preferably require that bonds be provided before the activity starts.

Monitoring Frameworks

Biodiversity offset requirements are typically long-term ventures. They may last more than a generation and several electoral cycles, and through significant council-staff turnover. To that end, monitoring frameworks must be clear and attached to an enduring arrangement (such as a consent recorded on an electronic database). The deliverables (including interim goals) should be detailed in consent conditions where possible (e.g. by way of reference to the Ecological Enhancement and Monitoring Plan) such that failure to achieve them results in non-compliance with the consent.

4.3.2 What future developments are required to improve evaluation tools?

The following are recommended as key components that should be integrated into the development of future tools designed to evaluate offset proposals. The design of evaluation tools should:

- Allow for the explicit accounting of the biodiversity elements of interest so that 'averaging' across important biodiversity values are not possible. (i.e. avoids the aggregation of important ecological variables into a single metric).
- Allow for effort to be 'fit for purpose' so that modelling exercises are not more complicated and potentially costly than required to account for the biodiversity values subject to the exchange.
- Be user-friendly, avoid 'black-box' calculations, and produce transparent and easily understandable outputs.
- Integrate assessments of risk and uncertainty of offset delivery as a mandatory part of the calculations.
- Include the ability to be applied to the habitat type of interest e.g. wetland, forest, estuarine, marine environments etc.

Council-driven development of future evaluation tools will be advantageous to: avoid numerous different approaches being offered by applicants, and allow for equity and consistency in assessment across different projects and applicants.

Monitoring and reporting is crucial to achieving good biodiversity outcomes

A robust monitoring programme linked to well-written conditions will give the council adequate basis to take this action if deemed appropriate. Establishing an offset should anticipate the scenario in which the requirements are not being met and be accordingly watertight.

4.3.3 Compliance and enforcement

Despite the substantial investment in establishing a biodiversity offset, there is good evidence that, once established, many requirements are never carried out or do not achieve their goals. Sometimes offsets fail. They fail due to operator error, random events, or other unforeseen circumstances. Data collected in 2010/2011 demonstrated that less than half of ecological mitigation[6] requirements were undertaken across a large dataset of more than 100 projects throughout New Zealand.[7] Sometimes a failure to meet conditions can be due to unfortunate factors outside the control of the applicant, but most non-achievement is a result of applicants simply not meeting the consent conditions as agreed.

Factors that have been demonstrated to achieve higher levels of compliance include:

- Early conversations between the applicant and the council to set expectations (e.g. applicants liaising early with council about their intentions for a site, enabling the flagging of vulnerable values and design in respect of those).
- Sufficient technical expertise available to undertake the project requirements (i.e. biodiversity offsetting is very complex and requires the input and ongoing involvement of suitable professionals with offsetting knowledge).
- A detailed plan being required at the time of granting rather than submitted at a later date.

Early and detailed engagement is key for the ongoing relationship between the council and the applicant.

Enforcement of requirements is sometimes necessary, but this in turn requires councils to be aware of the non-compliance in the first place. Thus, it is important that councils:

a. adequately resource monitoring of offset outcomes and compliance with offset related conditions of consent, and

b. give adequate priority to enforcing offset requirements compared with other consent obligations; and

c. adequately train staff for this purpose.

Enforcing compliance is only possible where it can be clearly demonstrated that a legal requirement has not been met (see 'Principles for consent conditions' above).

(6) At the time this research was conducted 'ecological mitigation' included both mitigation and offsetting. It is unlikely that the trends of delivery would differ much between mitigation or offsetting.
(7) Brown MA, Clarkson BD, Barton BJ, Joshi C 2013. Ecological compensation: an evaluation of regulatory compliance in New Zealand. Impact Assessment and Project Appraisal: 31(1):34–44.

Chapter Five

Strategic mechanisms for delivering biodiversity offsets

This chapter explores options for strategic delivery of biodiversity offsets and governance mechanisms that can minimise risk and improve outcomes for biodiversity under biodiversity offsetting policies. This chapter is likely to be of specific interest to council ecologists, biodiversity programme managers, and strategic planners.

Recommendations for using strategic mechanisms to deliver biodiversity offsets:

- Additional biodiversity gains may be achieved using offsets on public land, already protected private land, or using existing programmes; but this needs to be carefully evaluated.
- Monetary contributions should only be used to deliver biodiversity offsets under specific conditions. Outside of these situations, monetary contributions should be treated as compensation.
- Providing offsets in advance can reduce risk and uncertainty associated with biodiversity offsetting but require institutional processes not currently in place to be effective.
- Several strategies can be employed in the absence of institutional mechanisms to secure offsets provided in advance including: staging consent conditions; use of an aggregated fund; and third-party agreements.

5.1 Can public land, already protected land or existing programmes be used to achieve offset gains?

Using public land to deliver biodiversity offsets has the potential to maximise biodiversity gains by improving existing values, improving connections and functionality at site and landscape scales, and expanding protection area networks. However, land tenure and ownership is influential, particularly in respect of governance of an offset.

Public land as a recipient site for offsetting, for example, creates a range of issues. Agencies (e.g. councils, Department of Conservation) manage land on behalf of the public and have statutory obligations to do so. Where it is proposed that an offset take place on public land, and some or all of the management actions associated with the offset might be considered to be 'business as usual' (e.g. core business, expected duty of care, or statutory obligations), the additionality of biodiversity gain that the offset generates can be questionable.

Using already protected private land or existing environmental programmes (e.g. council-run biodiversity enhancement programmes) to deliver offsets also brings similar challenges in regards additionality as using public land. Table 7 provides guidance on additionality under various situations.

What is additionality?

Additionality is an underpinning key principle of biodiversity offsetting and requires that an offset must achieve gains in biodiversity above and beyond gains that would have occurred anyway.

Examples of activities that are unlikely to qualify as additional include actions otherwise required by law (e.g. plant pests for which eradication is identified in a Regional Pest Management Plan), or existing management arrangements (e.g. meeting the management conditions of a QEII National Trust Open Space Covenant) as only a new gain can offset a new loss.

Table 7: Guidance on determining whether a proposed offset action implemented on public land, already protected private land, or using existing programmes would generate additional gains under various scenarios. These guidelines can also apply to other scenarios not listed here.

Scenario	Biodiversity gains may be additional in the following situations:	Biodiversity gains will not be additional in situations where the proposed action:
Offset to be implemented on public land	• There is explicit and formal acknowledgement that, although a mandated responsibility, management of public land is not funded or planned for, and will not be funded or occur within the specified time horizon over which no-net-loss is being calculated. • There is an explicit policy position that specified goals will be delivered using biodiversity offsets.	• Aims to avert loss of area (no gain as land already protected). • Is already planned for. • Is already funded or is likely to be funded in the absence of the offset. • Might reasonably be expected to be undertaken within the time-horizon over which no-net-loss is being calculated.
Offset to be implemented on private, protected land (e.g. land protected using a QEII National Trust Open Space Covenant)	• The proposed offset includes actions and generates gains beyond the required contractual agreement with the covenanting agency. • It can be defensibly demonstrated that the estimated biodiversity gains would not have been generated through the course of legal compliance or landowner management of the property and/or offset site.	• Aims to avert loss of area (no gain as land already protected). • Includes actions which are already planned for under a contractual agreement or are legally required. • Is expected as part of 'duty of care' standards. • Is required as a condition of a separate resource consent. • Includes actions that would otherwise be delivered by an existing regional programme (e.g. possum control).
Using existing programmes to deliver offsets	• The programme explicitly indicates that offsets will be used to deliver the programme. • Offset funding does not replace existing funding tagged to deliver the programme goals.	• The programme consists of 'business as usual' outcomes, basic duty of care requirements, or is part of conditions of consent or a negotiated arrangement or partnership independent of the activity for which the offset is being sought.

Case study

Offset actions implemented within a council owned reserve

An offset of weed and pest control is proposed to be implemented within a council-owned reserve. However, the relevant reserve management plan details weed and pest control as activities required for the on-going management of the reserve. As the resources are not currently available to fund the implementation of the reserve management plan, the council has accepted the biodiversity offset to deliver part management of the reserve.

Under what situations would biodiversity gains be additional?

- Where it can be demonstrated that tagged funding has not been allocated to the reserve and funding is not planned for the future.
- Where the reserve management plan, or some other council document explicitly identifies that biodiversity offsetting will be used as a mechanism to deliver on-site biodiversity enhancement or management.
- Where the offset action can be demonstrated to exceed the level of work explicitly planned for the site (e.g. controlling additional pest species than planned for), and would generate a greater amount of biodiversity gain that would be generated otherwise.

A clearly stated intention for where the displaced funding might be spent to enhance biodiversity elsewhere (to guard against cost-shifting) would also be best practice.

5.2 When can a monetary contribution be used to deliver an offset?

The recent RMA reforms mean that councils will not be able to require 'financial contributions' after 2019. However, a monetary contribution may be used to deliver an offset (or part of an offset) in some distinct circumstances. Outside of these circumstances, any monetary contribution is merely compensation.

In some situations, an applicant may wish to transfer the implementation of an offset to another party whilst retaining the fiscal responsibility for the delivery of the offset. This might be considered an appropriate action to deliver an offset provided the following were observed:

- All other requirements of an offset had been met.
- The amount contributed is adequate to cover the full costs of the size of the offset actions required.
- The expenditure of the contribution can be transparently linked to the losses being offset.
- The contribution is used to implement offset actions in-line with the agreed offset plan and not used for other purposes.
- All conditions relating to delivery of the offset are legally enforceable and accountability is clear

A monetary contribution should be categorised as compensation when:

- The amount offered is arbitrary.
- The contribution will be to a fund (or pool of money) for 'good works' that are not explicitly assessed and measured to be adequate and appropriate to balance the losses for which the contribution is being made.
- The losses incurred and the expenditure of the contribution are not linked, traceable, or balanced.
- The contribution is to be used to fund outcomes not associated with a transparent offset assessment, including other environmental or social outcomes.

5.3 Minimising risk in the delivery of biodiversity offsets

Offset policy and practice in New Zealand is currently applied case-by-case and usually involves the development and associated biodiversity losses occurring before the offset actions are implemented and thus before offset gains are generated. This creates risks and uncertainties that the proposed offset benefits will occur. However, there are limited alternatives in the current context. An evaluation of some of these within the context of the RMA is set out in the following section.

5.3.1 Can offsets be provided in advance?

Undertaking offsets in advance of development reduces uncertainty and the need for time discounting of conservation gains, both of which are fundamental components of biodiversity offsetting. Despite the advantages it offers for biodiversity outcomes (Table 8), the practice of providing offsets in advance is uncommon in New Zealand. This is largely due to uncertainty about the legality of doing so and a lack of assurance that the council will take the offset gains into consideration at the time of evaluating the development proposal, and thus that the investment upfront will be worthwhile for the applicant.

Councils may be reluctant to acknowledge any offset gains in advance, particularly when the nature of the proposed corresponding impact is not well understood. There is also a hesitation towards offsets provided in advance as councils may be cautious about compromising their decision-making (e.g. such as by raising expectations of consents being eventually approved).

Further, the extent of additionality provided by the offset can be uncertain, because it can be difficult to ascertain what conservation efforts form part of the 'existing environment' (i.e. would have occurred anyway) and what are deliberately undertaken in respect of the proposed impact.

Clarification and development of the legal tools and processes necessary to facilitate offsets in advance is required.

The advantages and disadvantages of providing offsets in advance are set out in Table 8.

Table 8: A comparison of the advantages and disadvantages in undertaking offsets in advance of, and after, development has occurred.

	Advantages	Disadvantages
Offsets provided in advance of development	• Biodiversity gains are achieved (in whole or in part) prior to biodiversity losses occurring. • Reduced need to allow for uncertainty in calculating the amount of offset needed. • Assurance for both the council and the wider public that all or part of the offset has already been achieved. • Confirmation by public/ council of the degree to which forecast trajectories of biodiversity gain are achievable (if required), beyond the time of consent issue.	• Councils may need to consider offset proposals outside of development applications, and possibly a long time prior to applications being lodged. This would require a transparent and traceable process that can extend beyond typical timelines and election cycles. • There are no existing mechanisms to recognise or administer offsets provided in advance. • Applicants have limited assurance that the investment is justified because the magnitude of the biodiversity losses have not yet been evaluated. • Offsets provided in advance need to be distinguishable from the 'existing environment'. However, how this is determined is yet to be resolved. • Likely to be restricted to industries that can be strategic over long time-frames due to the mismatch in timescales of economic drivers of development and time for biodiversity gains to accrue. • Can create expectations that biodiversity losses will be allowed without first exploring options to avoid, as the investment in an offset has already been made. • Can raise expectations that consents will be granted before the councils have seen the final application.
Offsets provided after development	• Council does not need to encounter the risk associated with trying to anticipate the relative value of biodiversity losses compared with gains.	• Risk that anticipated biodiversity offset gains are not achieved • A larger total offset is required to account for the uncertainty associated in trading certain biodiversity losses now with uncertain biodiversity gains in the future. • Greater compliance measures are usually required because of the lack of certainty that estimated biodiversity gains will actually be secured. • The applicant has less incentive to carry out the offset once development approval is issued.

There are currently no mechanisms in place within local government to secure offsets provided in advance, and this is unlikely to change until formal banking systems are established and readily available. However, this does not mean the advantages of offsetting in advance cannot be captured under certain conditions. Certain development types lend themselves more readily to offsets being able to be provided in advance. These include major infrastructure projects and other long-term development projects in which the nature and scale of the development can be anticipated some years in advance. Councils and applicants can work together to 'front-end' offsets as much as possible using the following strategies:

Proceed in stages with the next stage contingent upon achieving interim outcomes. Staging of development approval enables a step-wise progression through both the impact and the offset. Making proceeding with the next stage of development contingent upon achieving certain interim outcomes in the offset programme can provide greater assurance to the council and wider community that the desired biodiversity gains have been achieved. A staged approach to development approval can also serve as a mechanism to manage the financial investment in the offset for the applicant.

Aggregated fund. An aggregated fund is a pool of money to which applicants contribute. The money is 'aggregated' to enable larger projects to be undertaken in strategically important areas, instead of the piecemeal approach delivered by multiple individual projects. Projects can be arranged in advance or once a certain amount of money has accumulated in the fund. Using an aggregated fund changes how an offset is delivered, however, the principles of offsetting remain the same. Careful administration of how the fund is spent is important to ensure it does adhere with the principles of offsetting (in particular, no-net-loss, which can be challenging when the impact occurs before the offset project is designed).

The contribution by the applicant to an existing conservation programme can be a quick and efficient means of securing a positive effect, and is likely to be particularly valuable for small scale projects by enabling aggregation of offset areas across development projects to maximise conservation value. The applicant might make a financial contribution (administered by Councils or another party) for the explicit purpose of achieving biodiversity gains under an existing strategic conservation plan providing that, among other things:

a. the gains are identified and are demonstrably additional, achievable and measurable,

b. it does not result in cost-shifting (i.e. does not displace existing or future funding for the outcomes),

c. the project actually does occur before the development impact does, and

d. the aggregated fund must be clearly tagged for offsets that target the same or similar values as those impacted by development projects (unless it is used to fund a trading-up offset) to ensure ecological equivalence is still observed.

The decision maker also needs to ensure that the desire to obtain funding to deliver the biodiversity enhancement proposed by an offset proposal does not 'colour' the decision about whether or not the biodiversity loss is acceptable in any given situation.

For example, Auckland Council is currently trialling an aggregated buy-in scheme for offsetting/ compensating for stream loss, where Council has costed management requirements on public land in headwater catchments and provided opportunities for applicants to contribute funding to achieve part of the overall stream restoration project, and which otherwise are not programmed for implementation in the foreseeable future. This allows applicants to easily 'buy-in' to a suitable compensation site, where protection and long-term maintenance is assured. Staff involved in the design and delivery of the offset actions are not involved in the decision regarding the loss of biodiversity from development. Moreover, such an approach would provide a strategic approach to achieving stream and catchment restoration where it is most needed and as a means to achieving full funding at a stream scale, allowing for more measurable benefits across a longer reach of stream, instead of only for portions of stream reach as has previously been the case. Any scheme would require independent evaluation and audit.

An aggregated fund is likely to present an administration challenge and may only be feasible for the larger and better-resourced councils. However, with careful administration, the right expertise involved, and a transparent process, smaller organisations could also consider using an aggregated fund.

CASE STUDY

Linking offset outcomes to staged development

A new quarry aggregate pit in South Auckland lies within native scrubland and secondary native forest up to 200 years old. Consents issued for the project require that the offset planting mature to provide habitat and food resources for kereru before older vegetation within the planned pit footprint is removed.

This staged development requirement has helped drive the design and planting of native trees across adjoining farmland to create kereru habitat within a timeframe that meets the quarry development programme. The conditions are not onerous; they merely require that forward planning and pro-active revegetation is undertaken so that the risk of not complying with the conditions, and potentially not being able to access part of the consented site, are minimised by the consent holder.

5.3.2 Can third-party agreements be used to deliver an offset?

Biodiversity offsetting in New Zealand generally relies upon resource consent applicants themselves delivering biodiversity gains following development. This contrasts with many other countries (Australia, Germany, and the United States for example) that enable the transfer of liability to deliver offsets to third parties. In some cases in New Zealand, responsibility can be informally shared with other parties, but there are limitations to this practice. For instance, by law (at least under the RMA), the original consent holder retains 'strict liability' responsibility for the delivery of the gain regardless of any private contractual arrangements.

Third-party agreements overseas provide an opportunity for a consent holder to meet their offset obligations to the consent authority through the purchase of offset credits from a third party. Third party agreements have not been extensively applied in New Zealand, largely because of the lack of a clear, enforceable mechanism by which responsibility of generating lasting biodiversity benefits on the ground can be transferred from the consent holder and enforced. However, it is still possible to carry them out as part of tailored arrangements. Where third party agreements are undertaken it is recommended that the following key things are in place:

- A formal documented relationship between the applicant and the third-party is put in place. This should cover the full requirements of implementing the offset over the full duration of the offset agreement, and includes any monitoring and reporting obligations. This could be delivered via a legal contract or more informally, a Memorandum of Understanding.
- Appropriate arrangements are in place to reflect the types of entities involved and their relevant needs and obligations. For example, a public agency may require the approval of elected officials to enter such arrangements, while a commercial enterprise may need to consider commercial sensitivity around certain details of the arrangement.
- The formal agreement must include an explicit process by which biodiversity gains will be measured and success of the offset evaluated. This should include a contingency plan (e.g. adaptive management) that provides for an appropriate response and additional effort should the offset actions fail to achieve the required biodiversity gains. This is particularly important where the consent conditions do little more than to ensure the inputs are provided, and thereby fail to secure the outcomes. For example, a consent condition may only require that the consent holder carry out certain actions (i.e. pay a certain amount to a trust) but fail to demand particular ecological outcomes. In such situations, the consent holder may be complying with required actions, but the expected environmental outcomes are often not achieved and there is no recourse for the council in that scenario. This highlights the critical need to focus consent conditions on outcomes and not inputs to achieve offset requirements.

See also: CHAPTER FOUR: What is needed to improve current practices?

Case study

An example of a third-party agreement to deliver environmental compensation

An aggregate quarry gained a 35-year consent to expand quarrying into a regionally rare forest type. Directly adjacent to the quarry a well-established community group had been undertaking weed management and replanting activities on a council reserve with the same forest communities and fauna habitats for two decades. As part of a wider avoidance, remediation, and mitigation package, the quarry company developed a 35-year management plan for the control of animal pests over the reserve, quarry property, and a wider buffer area on private land.

A formal agreement between the quarry and the community group was established which included a contracted amount of funding/year and a list of agreed actions. Funding was provided to the community group to undertake required pest control over the 35-year period, with assistance from professional animal control experts, including annual monitoring and adaptive management protocols should the control targets not be achieved. These actions were predicted to result in additional biodiversity gains because the weed and pest control to date had been year-to-year and not secure. Therefore, the compliance with the quarry's management plan was reliant on the activities of a third party.

It should be noted that where funding is provided to a stakeholder in this way, it can be perceived as 'buying' their approval. This is a very real risk, so ensuring the exchange reflects the principles of offsetting will help protect the quality of decision-making and the integrity of the arrangement.

NB: There are currently no known examples of a third-party agreement to deliver a biodiversity offset in New Zealand. However, the mechanism for using third-party agreements is the same.

Appendix

Recommended wording for biodiversity offsetting provisions in regional policy statements and/or regional and district resource management plans

This appendix provides recommended wording for biodiversity offsetting provisions for inclusion in regional policy statements and/or regional and district resource management plans. These polices have been set out to reflect that no-net-loss, or preferably net-gain, should be an objective of a biodiversity offset for those elements of biodiversity which are the target of the exchange., Local authorities may wish to control different activities within their jurisdiction, and this flexibility can be reflected in a variance of rules. However, it is recommended that biodiversity offsetting provisions are consistent at the policy level across the country.

Policy 1: Protection and management of significant indigenous vegetation and significant habitats of indigenous fauna

Recognise and protect areas of significant indigenous vegetation and significant habitats of indigenous fauna by:

a. avoiding the adverse effects of vegetation clearance and the disturbance of habitats as far as practicable; then

b. remedying any adverse effects that cannot be avoided; then

c. mitigating any adverse effects that cannot be remedied; and

d. where there are any reasonably measurable residual adverse effects on the significant indigenous vegetation and significant habitats of indigenous fauna, consider the offsetting of those effects in accordance with [the offsetting policy/appendix]; and

e. if a biodiversity offset in accordance with the [biodiversity policy/appendix] is not achievable for any of the biodiversity elements for which there are residual adverse effects, for those elements, consider environmental compensation that generally follows the principles in [the offsetting policy/appendix] as far as reasonably practicable.

Policy 2: Protection and management of other indigenous vegetation and habitats

Manage the effects of activities on other areas of indigenous vegetation and habitats of indigenous fauna by:

a. avoiding the significant adverse effects of vegetation clearance and the disturbance of habitats as far as practicable; then

b. remedying any significant adverse effects that cannot be avoided; then

c. mitigating any significant adverse effects that cannot be remedied; and

d. where there are any significant residual adverse effects on the indigenous vegetation and habitats of indigenous fauna, consider the offsetting of those effects in accordance with [the offsetting policy/appendix]; and

e. if a biodiversity offset in accordance with the [biodiversity policy/appendix] is not achievable for any of the biodiversity elements for which there are residual adverse effects, for those elements, consider environmental compensation that generally follows the principles in [the offsetting policy/appendix] as far as reasonably practicable.

Policy 3: Biodiversity offsetting

The following sets out the framework for the use of biodiversity offsets. While setting out a framework for the use of biodiversity offsets, many of the concepts are also applicable to environmental compensation where positive actions (not including biodiversity offsets) to compensate for residual adverse biodiversity effects arising from activities after all appropriate avoidance, remediation, mitigation and biodiversity offset measures, are proposed.

a. Restoration, enhancement and protection actions will only be considered a biodiversity offset where they are used to offset the residual effects of activities after the adverse effects have been avoided, remedied or mitigated in accordance with [the relevant policies].

b. The outcome should be no-net-loss, and preferably a net-gain in the indigenous biodiversity values for which the offset is sought. Where this can be achieved for some biodiversity values and not others within the same project the values for which an offset (no-net-loss or net-gain) is achieved must be clearly differentiated from the biodiversity values for which an offset has not been achieved.

c. Restoration, enhancement and protection actions undertaken as a biodiversity offset are demonstrably additional to what otherwise would occur, including that they are additional to any avoidance, remediation or mitigation undertaken in relation to the adverse effects of the activity.

d. An offset which is provided (at least in part) in advance of an application for resource consent, does not guarantee granting of consent, but will be taken into account by the Council where:

    i. There is a clear link between the offset and the future effect. That is, the offset can be shown to have been created or commenced in anticipation of the specific effect and would not have occurred if that effect were not anticipated;

    ii. A clear baseline of indigenous biodiversity value has been established which can show the biodiversity gains accrued through the offset; and

    iii. Additional offset actions where an evaluation of the biodiversity gain achieved under the offset provided in advance is shown to be inadequate to achieve at least a no-net-loss of indigenous biodiversity values.

    iv. The application demonstrates how the requirements of the framework set out in this appendix will be addressed.

e. Offset actions should be undertaken close to the location of development, unless another location will result in a preferred indigenous biodiversity outcome.

f. The values to be lost through the activity to which the offset applies are counterbalanced by the proposed offsetting activity, which is at least commensurate with the adverse effects on indigenous biodiversity. A proposed biodiversity offset must contain an explicit loss and gain calculation commensurate to the scale of effects of the activity, and must demonstrate the way no-net-loss can be achieved for each of the elements of biodiversity for which no-net-loss is desired.

g. The offset is applied so that the biodiversity values being achieved through the offset are the same or similar (like-for-like) to those being lost, unless biodiversity of lesser conservation value is exchanged for biodiversity of a greater conservation value and such a 'trading-up offset' can be demonstrated to deliver greater gains than a like-for-like exchange.

h. There is a strong likelihood that the positive biodiversity outcomes of the offset last at least as long as the impact of the activity, and preferably in perpetuity. Adaptive management responses will be incorporated into the design of the offset, as required and captured in conditions of consent to ensure that the positive ecological outcomes are maintained over time.

i. The biodiversity offset will be designed and implemented in a landscape context – i.e. with an understanding of both the impact and offset sites' roles, or potential roles, in the landscape context of the area.

j. Any application that intends to utilise an offset must include a biodiversity offset management plan that:

   i. clearly states the elements of biodiversity for which an offset is being sought;

   ii. sets out baseline information on indigenous biodiversity that is potentially impacted by the proposal at both the impact and offset sites;

   iii. demonstrates how the requirements of the framework set out in this appendix will be addressed;

   iv. details the offset actions that will achieve the estimated gains at the offset site(s); and

   v. identifies the monitoring approach that will be used to demonstrate how the matters set out in this framework have been addressed, over an appropriate timeframe.

Policy note: Further information on the design of an offset should be obtained from the [Local Government guidance document on biodiversity offsetting under the Resource Management Act], New Zealand Government Guidance on Good Practice Biodiversity Offsetting in New Zealand August 2014 (or any successor document), and BBOP.

For the purposes of this policy:

Biodiversity offset

Means a measurable conservation outcome resulting from actions designed to compensate for residual adverse biodiversity effects arising from activities after appropriate avoidance, remediation and mitigation measures have been applied. The goal of a biodiversity offset is to achieve no-net-loss and preferably a net-gain of indigenous biodiversity values.

No-net-loss

Means no measurable loss in the value of the elements of biodiversity for which a no-net-loss objective is sought compared with the expected biodiversity value of those same elements within a stated time horizon should the offset not have occurred.

Environmental compensation

Means actions (not including biodiversity offsets) to compensate for residual adverse biodiversity effects arising from activities after all appropriate avoidance, remediation, mitigation and biodiversity offset measures have been applied.

Trading-up offset

Involves an out-of-kind exchange of one type of biodiversity for a different type of biodiversity which is of greater conservation value.

Offset provided in advance

Refers to offset actions that have generated gains in anticipation of, but prior to, residual effects that will occur as a result of a specific activity planned for the future.

Glossary

Accounting system refers to the system or model used to calculate net change in biodiversity values between an impact site and an offset site. The accounting model produces an estimate of whether an offset proposal can demonstrate a no-net-loss exchange. Biodiversity offsetting accounting systems must incorporate uncertainty and time lags to account for the exchange of a certain loss of biodiversity at the time of impact with an uncertain gain of biodiversity in the future.

Adaptive management refers to a systematic, iterative process of decision-making that aims to reduce uncertainties and increase knowledge by learning from outcomes resulting from management actions. It requires monitoring of outcomes against clearly stated objectives and the application of acquired knowledge to future management actions.

Additionality refers to the concept that biodiversity gains generated by offset actions must be additional to gains that could reasonably be expected to occur anyway (without the offset actions occurring). Any biodiversity gains that are not additional cannot be counted as contributing to a no-net-loss objective.

Averted loss offset refers to offsets that generate biodiversity gains (relative to a credible 'business as usual' scenario) by preventing the future loss of existing sites. Averted loss offsets can only generate biodiversity gains if they are used to secure the protection of a proposed offset site that is a) at threat of loss but is currently unprotected; and b) would remain unprotected if the offset did not happen. A change in tenure status is typically used to avert the loss of area, whereas active management of the site can be used to avert the loss of condition at the offset site. Averted loss offsets are sometimes referred to as 'avoided loss offsets'.

Business and Biodiversity Offsets Programme (BBOP) is an international collaboration between companies, financial institutions, government agencies, scientists, policy makers, industry, and non-governmental organisations. The BBOP has developed the most thinking, guidance, and technical support documents on biodiversity offsetting globally. (see http://bbop.forest-trends.org/)

Biodiversity refers to the variability among living organisms, and the ecological complexes of which they are a part, including diversity within species, between species, and of ecosystems. In this document, our use of biodiversity refers to biodiversity that is indigenous to New Zealand, rather than biodiversity that has been introduced by people.

Biodiversity offset/ Biodiversity offsetting is a measurable conservation outcome resulting from actions designed to compensate for residual adverse biodiversity effects arising from activities after appropriate avoidance, remediation, and mitigation measures have been applied. The goal of a biodiversity offset is to achieve no-net-loss and preferably a net-gain of indigenous biodiversity values. To qualify as a biodiversity offset, the action taken to secure the biodiversity gains must adhere to a set of principles that include: limits to offsetting; no-net-loss; equivalence; additionality; and permanence. Within this document 'offsetting' always refers to biodiversity offsetting.

Currency refers to the universal value used within an accounting system to convert the measurements of biodiversity (the metrics) for which no-net-loss is sought. Using a common currency allows for these components of biodiversity to be compared, aggregated, and traded (where appropriate) across types and places. The currency is then used to assess the ecological equivalence of the biodiversity gained through a proposed offset with the biodiversity lost.

Discount rate is the rate used in offset calculations to account for the time-lag between biodiversity losses due to development and biodiversity gains due to an offset. Discount rates are typically used to account for time preference but can also be used to for other discount types such as default risk or inflation/deflation.

Ecological equivalence is the degree of similarity in biodiversity values between impact and offset sites. It describes the degree to which the biodiversity gain attributable to an offset is balanced with the biodiversity losses due to development across type, amount, space, and time; and therefore, whether the exchange achieves no-net-loss. Assessing ecological equivalence requires the biodiversity at both the impact and the offset site to be described and measured to quantify losses and gains. Demonstrating ecological equivalence differentiates biodiversity offsetting from environmental compensation.

Effects management hierarchy (internationally the mitigation hierarchy) refers to the set of steps applied sequentially that seeks to, in order of prior application, avoid, remedy, and then mitigate for the impacts of development on biodiversity. Iterative application can further reduce impacts on biodiversity. Offsetting and compensation should only be considered after the effects management hierarchy has been applied to the extent practicable. Internationally the mitigation hierarchy places emphasis on mitigation prior to remedy (avoid, minimise, rehabilitate). This document is consistent with the RMA hierarchy. The critical aspect of the hierarchy is that offsetting or compensation is not considered until after the three prior steps have been taken.

Environmental compensation means positive actions (excluding biodiversity offsets) to compensate for residual adverse biodiversity effects arising from activities after all appropriate avoidance, remediation, mitigation and biodiversity offset measures have been applied.

Good Practice Guidance refers to the New Zealand Government's Guidance on Good Practice Biodiversity Offsetting in New Zealand (New Zealand Government 2014).

Impact site is the area or site where the activity causing biodiversity losses occurs. A single project might include several impact sites.

Like-for-like is the concept of comparing the same type of biodiversity when evaluating a no-net-loss biodiversity offset exchange. Like-for-like can be expressed across different scales of describing biodiversity. For example, at the broad ecological community, habitat, or vegetation community level (e.g. podocarp-broadleaf forest; dune swale wetland); with more specificity, (e.g. species level); or at an even finer resolution such as critical habitat elements (e.g. tree hollows). Therefore, it is important that an offset policy or proposal clearly states which elements of biodiversity are the target of a like-for-like exchange.

Metrics refers to the measurements used to describe the state of the elements of biodiversity for which no-net-loss is sought and allows changes to biodiversity values (either at the impact site or the offset site) to be quantified in standard units. Metrics enable the overall net balance of biodiversity to be calculated and ecological equivalence of the exchange to be evaluated.

Mitigation refers to any action that alleviates or moderates the severity of an impact caused by something. Actions that mitigate impacts may also minimise those effects.

Mitigation hierarchy see **Effects management hierarchy**.

Monetary contribution refers to a monetary payment made to compensate for residual biodiversity losses. Depending on the circumstances, the payment can contribute to the delivery of a biodiversity offset. Outside of these circumstances, the payment would be considered as compensation. When used as compensation, the payment would more preferably be used for biodiversity or environmental outcomes but decision-makers may also consider it appropriate for the payment to be put towards desired social outcomes.

Multiplier is a factor used to adjust the size of the offset so that gains are greater than losses and are used to account for various factors including: risk of failure; uncertainty in offset action; imperfect exchange currencies; time-lags; biodiversity conservation objectives. A discount rate is a type of multiplier.

No-net-loss refers to the objective for a biodiversity offset to generate sufficient gains in target biodiversity values to balance the losses of target biodiversity values due to the development. This requires that at a specified point in time values of the elements of biodiversity for which a no-net-loss outcome is sought will be returned to the point they would have been if both the impact and the offset had not occurred. Evaluating whether an offset proposal achieves a no-net-loss objective requires estimating whether values gained are ecologically equivalent (across type, amount, space, and time) to the values lost, taking into account uncertainty and time-lags between biodiversity losses and gains.

Net-gain describes the conceptual objective that at a specified point in time biodiversity values will be returned beyond the point they would have been if the impact had not occurred. Thus, net-gain offsets achieve conservation gains, but only for the proportion of the offset that increases biodiversity values above the point of a no-net-loss offset.

Offset actions are the management actions used to secure biodiversity gains at an offset site. For example, change in land tenure, pest control, revegetation, or stream restoration. A single offset proposal can include several discrete offset actions.

Offset site is the area or site where offset actions are implemented and which generates the gains to compensate for losses. A single offset proposal might include several offset sites.

Out-of-kind refers to exchanges that involve trading one type of biodiversity for a different type. Thus, out-of-kind exchanges of biodiversity sit outside no-net-loss like-for-like objectives. Out-of-kind exchanges may still achieve an acceptable level of ecological equivalence where biodiversity gained is considered to be of greater ecological or social importance than the biodiversity lost (see 'trading-up'). Out-of-kind exchanges that 'trade-up' still require the use of a currency to describe and measure the elements of biodiversity being exchanged and an evaluation of whether the trade is adequate. Out-of-kind exchanges of biodiversity that do not trade-up do not qualify as a biodiversity offset and are instead a form of environmental compensation.

Rehabilitate, Remediate and Restore all refer to measures taken to improve degraded or reinstate removed ecosystems following exposure to impacts that cannot be completely avoided. The meaning of each is quite specific, however in the context of this guidance and offsetting, all three terms are considered to generate improvements to biodiversity, irrespective of the particular circumstances of their application.

Trading-up refers to an out-of-kind exchange that involves trading one type of biodiversity for a different type of biodiversity of greater value, for example exchanging the loss of a non-threatened species for a gain in a nationally threatened species . As the exchange is not like-for-like, losses of the impacted biodiversity remain. A trading-up offset still requires transparent quantification of losses and gains and evaluation to demonstrate that the amount of gain is greater than the losses. Where out-of-kind exchanges do not trade-up, they are not offsets but environmental compensation. Where out-of-kind exchanges trade between Threatened Classifications, they are also not offsets but compensation (as all nationally threatened species are of high conservation value, so none are of 'greater value' than others), and this type of exchange is not supported by this Guidance.

Further reading

Chapter One: Introduction

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Chapter Three: Evaluating the adequacy of offset proposals

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