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planning and environment

IMPROVING OUTCOMES FROM THE DELIVERY OF BIODIVERSITY OFFSETS AND COMPENSATION

CHALLENGES AND OPPORTUNITIES FOR THE USE OF STRATEGIC MECHANISMS

DECEMBER 2022

USE OF THIS REPORT

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EXECUTIVE SUMMARY

Biodiversity offsetting is an effects management approach that aims to generate sufficient gains in target biodiversity in one place to counterbalance residual losses in the same target biodiversity elsewhere due to the adverse impacts of a development activity. Biodiversity offsetting requires the strict adherence to the effects management hierarchy (applying only to residual losses after impacts have sequentially been avoided, minimised, or remedied) as a prerequisite, and is underpinned by a suite of principles which collectively compel ecological equivalence of the trade, describe the rigour of application, and define the goal (e.g., no net loss or net gain) sought. In contrast, compensation as the last sequential response within the effects management hierarchy differs from biodiversity offsetting in that ecological equivalence is not required. As such, compensation measures provide the least certainty for equivalent biodiversity outcomes and are therefore the last, and least preferred response to residual adverse effects arising from development activities.

Strategic mechanisms for the delivery of biodiversity offsetting or compensation are formal arrangements which combine some form of an economic model to facilitate the exchange of biodiversity and a spatial conservation plan. Thus, strategic mechanisms have the potential to integrate offsetting and compensation into spatial plans, allowing effects management from individual consent applications to contribute to specific local or regional biodiversity targets. This think-piece explores the feasibility of this concept under the current policy and practice settings and identifies key factors for consideration in future policy development.

This report brings together a desk-top evaluation of the current state of play in the use of offsets and compensation in New Zealand and our views as informed by our cross-disciplinary experience and expertise. Draft versions of this report were subject to two rounds of review involving specialists from central and local government, industry, academics, research scientists, and environmental and ecological advocacy groups. Here we summarise our findings and conclusions and recommend actions for both local and central government. The evaluating and thinking supporting these conclusions and consequential recommendations is summarised in the body of the report with further detail provided as appendices.

Conclusions

Based on our assessment and findings we draw the following conclusions:

- New Zealand is still grappling with many of the fundamentals of biodiversity offsetting. It is premature for councils to pursue formal schemes to deliver biodiversity offsets or compensation while key institutional settings (including knowledge, capacity, governance, and compliance) are still lacking. *Until these issues are resolved, formal strategic mechanisms, including biobanking, should not be pursued by councils, as doing so risks entrenching further biodiversity declines. The premature establishment of formalised strategic mechanisms will not improve on the status quo and may serve to entrench poor practice.*
- Formalised market-based schemes would necessitate a simplification of exchange to facilitate the trade, thus 'relaxing' offset design principles (e.g., degree of ecological equivalence or spatial proximity of the gains to the losses), and rigour and are therefore more likely to lend themselves to compensation outcomes. *Facilitating compensation trades over biodiversity offsetting to a no net loss or net gain standard is not an appropriate response to the biodiversity crises.*

- Strategic mechanisms could facilitate improved offsetting outcomes in limited circumstances. For example, where common species and habitat, or non-complex ecosystems are involved. This would potentially allow for a hybrid approach whereby strategic mechanisms can be used to address adverse effects on simple, common, and easily tradable systems while bespoke offsets are designed on a project-by basis for more complex components of biodiversity. However, these 'simple and common' components of biodiversity are typically excluded from plan provisions (or subject to Permitted Activity status) and thus not captured by effects management regimes in the first instance. That is, the biodiversity components for which strategic mechanisms currently could be applied appropriately are the same components for which little or no protection is extended. Without the compulsion to obtain a resource consent there is no driver to participate in an exchange scheme. This in of itself is problematic. *The continued permitted loss of biodiversity undermines no net loss policies and objectives for improved biodiversity outcomes. Opportunities to use strategic mechanisms to improve biodiversity outcomes are constrained by the current policy settings.*
- There is potential for improved outcomes for biodiversity where offset (or compensation where an offset is not possible) proposals align with existing conservation projects or biodiversity enhancement programmes. *Provided there is opportunity to do so, there is clear proof of additionality, and roles, responsibilities, and onus for delivery are well understood. This can be encouraged on a case-by-case basis, outside of a formal scheme.*
- Significant resource management reform is in progress which will change the current policy settings within which the effects management hierarchy, including offsetting and compensation, is managed and implemented. The reform has the potential to address many of the challenges we identify here and in doing so create the necessary national-level architecture and institutional settings to enable formal strategic mechanisms that improve on current practice and do not risk undermining biodiversity outcomes to be implemented at regional-levels. *The issues raised in this report can therefore inform the reform process, and indicate where future national-level direction and guidance needs to be directed.*
- In the meantime, the current policy settings allow for the provision of offsets or compensation measures to be delivered in advance of biodiversity losses occurring. *This should be encouraged and supported by clear policies and formal agreements*.
- There are many other actions that councils can take outside of formal schemes to improve biodiversity outcomes including: improving current practice for biodiversity offsetting (or compensation where an offset is not possible) and being more strategic in terms of offset and compensation actions and location outside of formal schemes in the short-term. *These opportunities should be pursued as a priority.*
- Capacity and capability in the discipline of effects management, including offset design and implementation, needs to be increased within councils and private practice. *Biodiversity offsetting (and effects management generally) needs to be recognised as a particular expertise and those involved in designing or evaluating effects management packages, including biodiversity offset or compensation proposals need to have the appropriate experience and qualifications.*

Recommendations

Our concluding comments highlight that there is much that can be achieved outside of strategic mechanisms and we recommend that directing focus in these areas would be both strategic and prudent. We also note that improving outcomes from biodiversity offsetting or compensation requires measures that span policy, governance, as well as implementation and technical dimensions. Below, we set out priority actions, which reflect these statements. We note that, by necessity, it is not a short list and that implementing these recommendations will require considerable and sustained effort.

We acknowledge that the Resource Management Reforms and/or yet to be gazetted national policy statements may address (in part or full), the issues and actions we highlight in this report. Therefore, we have focused on actions for local government to focus on in the immediate, short, or medium-term to reflect the changing context in which this report sits.

Priority actions for local government

There is much that councils can do outside of a formal scheme to improve on current practice under the current policy settings. We group recommended actions into priority bands below.

Priority A: Immediate and ongoing | Year 0 onwards

- Establish and maintain a compulsory, publicly available, regional register and spatial database of biodiversity offsets and compensation measures for use in the interim until a national system can be established.
- Review and revision of the Permitted Activities that have adverse effects on indigenous biodiversity and which do not require adverse effects to be managed.
- Advocate for net gain objectives for biodiversity offsetting across all activities that have any adverse effects on indigenous biodiversity.
- Improve compliance monitoring and reporting.
- Improved use of consent conditions to ensure offset or compensation designs are implemented as proposed, including embedding quantified, timebound, target outcomes (alongside necessary actions), use of trigger consent conditions, staged conditions, and clearly defined contingency measures within consents that include offset or compensation measures.
- Improve communication of expectations to resource consent applicants. Emphasis should be placed on communicating the need for adherence with the effects management hierarchy; and increased endeavours to avoid adverse effects in the first instance, and improved design of offset or compensation proposals, including demonstration of anticipated outcomes and transparency of supporting documentation.

- To support the implementation of offset or compensation actions in advance, we recommend that councils:
    a. Adopt an explicit policy[1] to set clear expectations of all parties.
    b. Commit to early and formalised engagement between applicants and councils and implement an explicit and transparent process for this engagement.
    c. Use formal Memoranda of Understanding (MOUs) to set out expectations and requirements of consent applicants until policy becomes operative. We also recommend that the use of MOUs continues to reflect policy once it is developed and to provide transparency of arrangement for all parties and stakeholders outside of the MOU.

Priority B: Short-term | Year 1–Year 3

- Improved processes for dealing with applications for variations to consent conditions associated with effects management requirements.
- Increase capacity and capability within councils to assess resource consent applications and biodiversity offset or compensation proposals.
- Bring policy documents and consenting processes in-line with National Policy Statements.
- Produce guidance (e.g., fact sheets; web-based checklists) detailing and formalising expectations and processes associated with proposing and designing an offset or compensation, including measures offered in advance of project commencement.
- Undertake regional-scale conservation planning and prioritisation, including the identification of actions needed to reverse the decline of biodiversity at regional, local, and ecological district-scales. This should include the identification of suitable places for offset sites and actions (or compensation actions for situations where offsetting is not feasible).

Priority C: Medium-term | Year 4–Year 6

- Incorporate clearly communicated, biota-specific, targets into biodiversity policy and strategy documents, and monitor and report progress and achievement of these.

Priority actions for central government

Central government plays an important role in directing, resourcing, or otherwise assisting local government to improve practice and consequently achieve outcomes for biodiversity. Here we identify key areas where national direction and targeted resourcing is required. We note that several of our recommendations are currently not reflected in the 2022 Exposure Draft of the National Policy Statement for Indigenous Biodiversity (or the National Policy Statement for Freshwater), and we suggest these recommendations be considered through the Resource Management Reforms or amendments to the National Policy Statements.

[1] For example, as described at section 5.1.

National direction is required to:

1. Compel quantified net gain outcomes for target biota from all offset proposals and demonstrated benefits from compensation measures (where offsetting is not feasible).
2. Require all more than minor residual adverse effects on indigenous biodiversity (including common indigenous species and ecosystems and non-significant areas of indigenous biodiversity) to be addressed through application of the effects management hierarchy.
3. Place the responsibility for managing adverse effects on all indigenous biodiversity, including biodiversity offsetting or compensation policies and methods, with regional councils, not territorial authorities. With a few exceptions, territorial authorities lack capacity and capability to meet their obligations for indigenous biodiversity protection and management.
4. Ensure that emerging legislation and policy direction does not directly or indirectly (e.g., via formal schemes) favour compensation trades over offsetting, or undermine the application of the full effects management hierarchy.
5. Incorporate offsetting considerations as informed by systematic conservation planning into regional spatial strategies (under the Spatial Planning Act).
6. Enable the provision of offset measures in advance where appropriate in a way that does not circumvent due process (e.g., application of the effects management hierarchy, additionality, ecological equivalence, involvement of stakeholders and submitters in the decision-making process, and providing for rights and interest of tangata whenua).
7. Continue efforts for nationally consistent policies, implemented at the regional level, including:
    a. Clear guidance on limits to offsetting and species and ecosystems that must be avoided.
    b. Application of the effects management hierarchy, and biodiversity offsetting and compensation across all environmental domains.
    c. Requiring that offset proposals must demonstrate a measurable net gain outcome for target biota.

National-level resourcing and oversight are required to:

1. Establish and maintain a compulsory, publicly available, centralised register and spatial database of biodiversity offsets and compensation measures that is spatially linked to projects, estimated outcomes, consented requirements, and monitoring results.[2]
2. Invest in the collection, analysis, and dissemination of comprehensive biodiversity data (across land-tenure).
3. Continue to produce national guidance on the fundamentals of biodiversity offsetting design and implementation for the purposes of improved and consistent practice (e.g., application of effects management hierarchy).
4. Undertake a research programme to determine the likely demand for a regulated biobank designed to deliver at least no net loss biodiversity offsets.

[2] See Kujala et al. 2022

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1. INTRODUCTION

1.1. Overview

In 2017, the Regional Council Biodiversity Working Group (BDWG) on behalf of the BioManagers, commissioned the development of national guidance for biodiversity offsetting under the Resource Management Act 1991 (RMA). That document[3] was made available on the Local Government New Zealand website in 2018 (2018 Guidance) and is intended to complement the existing guidance produced by the New Zealand Government in 2014[4] (2014 Guidance).

The guidance and subsequent workshops helped to clarify many questions about offsetting under the RMA. They also helped to progress understanding of the broader ecological effects management hierarchy and its appropriate use. However, they illuminated further areas that require attention as well. Despite the many issues, biodiversity offsetting and compensation will remain an important component of effects management in New Zealand and therefore, the challenges faced in achieving good biodiversity outcomes remain a priority for resolution. After discussions with the Ministry for the Environment (MfE) and the Department of Conservation (DOC), both of whom are intending to produce guidance to implement the effects management hierarchy[5], the BDWG identified two priority themes requiring further guidance that neither MfE nor DOC would be covering in their respective workstreams:

1. Further guidance on strategic mechanisms for delivering offsets and compensation.
2. The feasibility of local biobanking schemes.

We were contracted by the BDWG to provide a think-piece on these topics and if feasible, provide guidance on the design and implementation of suitable mechanisms. Building on earlier analysis on the feasibility of biobanking published by the Environmental Defence Society (Brown 2017), we evaluated the potential for local scale biobanking schemes and concluded that little has changed since the 2017 report was published, and the institutional settings needed for successful biobanking schemes are still lacking. This applies to local-scale as well as national-scale biobanking initiatives, and we caution against attempts to undertake biobanking in the absence of necessary administrative, governance, and technical support systems (see Appendix 1). We therefore focus this think-piece on other strategic mechanisms.

In drafting this report, we have made several assumptions including:

- Readers of this document understand offsetting principles and application.
- The authors, in discussing only offsetting and compensation in this report, do not condone circumvention of best practice and full application of the effects management hierarchy including due consideration of options to avoid adverse effects.

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[3] Maseyk F, Ussher G, Kessels G, Christensen M, Brown M 2018. Prepared for the Biodiversity Working Group on behalf of the BioManagers Group.

[4] New Zealand Government 2014. Guidance on Good Practice Biodiversity Offsetting in New Zealand. New Zealand Government, Wellington.

[5] To support the National Policy Statement for Freshwater Management and the yet to be gazetted National Policy Statement for Indigenous Biodiversity.

- This document does not advocate for the use of compensation schemes over other options for addressing adverse effects.
- This report will be read alongside the 2014 and 2018 Guidance documents, neither of which are replaced by this report.

1.2. Who are we?

We bring to this report our collective experience and expertise which spans biodiversity offsetting theory and practice; design, review and evaluation, and implementation of biodiversity offset and compensation proposals; biodiversity policy development; consenting and compliance; and natural resources law.

Dr Fleur Maseyk: was project manager and lead author of the 2018 Guidance document and co-presented the 15 workshops around the country; led the development of a biodiversity offsets accounting model for the Department of Conservation's offsetting toolbox and led the drafting of the User Manual and case study calculations; presents expert evidence on ecological, biodiversity policy, and effects management matters in council and RMA hearing fixtures for local government, iwi and hapū, and environmental organisations; provides peer review of application of loss:gain calculations and offset proposals; runs workshops for consent planners, decision makers, and technical assessors on the principles and application of biodiversity offsetting; was part of a research team advising the Australian Government on the 'risk of loss' component of their biodiversity offsetting policy; and has authored several papers on biodiversity offsetting in international peer-reviewed and local journals.

Dr Graham Ussher: was a key author of the 2018 Guidance document and co-presented the 15 workshops around the country; has worked extensively with all sectors of land, transport, energy generation, and resource development on projects that involve assessments of ecological effects and the development of approaches to manage residual effects (including offsetting); was science advisor (2012–2013) to the New Zealand Government research project on the application of offsetting to New Zealand (which led to the development of the 2014 Guidance document); has developed, tested, and applied offset models as part of research projects, consent applications, and expert representation on RMA cases for local government and commercial clients; assisted the NZ Transport Agency to prepare national guidance on the use of biodiversity offsetting for roading projects; regularly presents expert evidence on these matters to local hearings, Boards of Inquiry, and the Environment Court; and has authored several papers on biodiversity offsetting in international peer-reviewed and local journals.

Mark Christensen was a co-author of the 2018 Guidance document; is experienced in all areas on environmental and resource management law; has particular experience in biodiversity related resource management issues, including advising corporates on biodiversity offset policies and consenting requirements; was a member of the Business and Biodiversity Offsets Programme (BBOP) Advisory Group; had involvement in the finalisation of the IUCN policy on biodiversity offsets; and has authored several papers on biodiversity offsetting in local journals.

We built off this collective experience in developing this think-piece. Our thinking has also been influenced by recent international developments in biodiversity offsetting and net gain policies, The work of the IUCN Commission on Ecosystem Management Impact Mitigation and Ecological Compensation Thematic Group

(IMEC), ongoing conversations with members of the BDWG and the two rounds of comprehensive and thought-provoking feedback on early drafts of this document, and participation in the Environment Institute of Australia and New Zealand's (EIANZ) National Biodiversity Offsets Conference held in Canberra in July of this year.

1.3. What are strategic mechanisms?

In this document we consider 'strategic mechanisms' to be approach that bring together some form of an economic model (or market-based approach) to facilitate an exchange of biodiversity and a spatial conservation planning model to identify appropriate target-based objectives to be achieved via the implementation of offset or compensation actions. These mechanisms can be used to better integrate offsetting and compensation into spatial plans, allowing effects management from individual consent applications to contribute to specific local or regional biodiversity targets.

Integral to this concept is that strategic thinking looks beyond individual actions and takes a broader view of the direction preferred and actively advocated by decision-makers. In the context of biodiversity offsetting, this could be interpreted as a broader context of the urgent need to reverse the biodiversity decline in New Zealand, and the part that regulatory mechanisms for biodiversity management (including biodiversity offsetting and compensation) play in this.

We also note that there are number of areas that councils could focus on that would greatly contribute to positive outcomes for biodiversity which we also briefly touch on (section 2.3).

1.4. Key terms and concepts of biodiversity offsetting and compensation

Biodiversity offsetting[6] evolved as an attempt to respond to the declining state of biodiversity in recognition that existing approaches to effects management have failed to halt biodiversity decline and unmitigated drawdown of natural capital and thus, a more sustainable model for development is required. The inherent assumption is that biodiversity offsetting can provide for development on the basis that residual adverse impacts on biodiversity will be managed in such a way that a no net loss (and preferably a net gain) of biodiversity will be achieved.

An underlying premise that we adhere to in this document is that the widely accepted standards and rigour around biodiversity offsetting cannot be set aside. This differentiates offsetting from ecological compensation (herein 'compensation'). Biodiversity offsetting includes fundamental principles of limits to offsetting, adherence to the effects management hierarchy, equity, no net loss, permanence, and science and stakeholder

[6] 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 (Maseyk et al. 2018). Definitions of biodiversity offsetting vary slightly but the elements we consider to be fundamental in defining an offset are indicated here in italics; we also recommend the goal of offsetting be net-gain but note the importance of retaining 'no net loss' as the absolute minimum threshold to qualify as an offset.

inputs. In addition, two key principles include the achievement of equivalence in an impact-offset trade and landscape context for locating an offset that does not diminish local biodiversity resources.

In contrast, compensation in the New Zealand context refers to measures designed and implemented to compensate for residual losses after efforts to avoid, minimise, or remedy have been exhausted and when it is not possible to achieve the standard required of a biodiversity offset. Compensation differs from biodiversity offsetting as it is not compelled to demonstrate no net loss, nor ecological equivalence, or adhere with other offsetting principles. However, good practice would endeavour to ensure compensation adheres with offsetting principles as far as possible, with the exception of demonstrating no net loss or a net gain (Maseyk et al. 2018).

The principles of landscape context and ecological equivalence are key points that we touch on throughout this document, as the potential workability of strategic offset schemes or the provision of offset or compensation measures in advance depends upon the rigour with which a strategic approach elects to hold true to these concepts.

1.5. Document structure and scope

We therefore focus this think-piece on:

1. The potential, challenges, and risks of strategic mechanisms generally (**Section 2**).
2. Combined[7] funds for the purpose of delivering offsets or compensation (**Section 4**).
3. Provision of offsets or compensation measures in advance (**Section 5**).

We also provide a brief summary of current policy setting and practice (**Section 3**). A glossary is provided at the end of the document.

Designing strategic mechanisms that guarantee appropriate effects management is complex and requires detailed design to avoid perverse outcomes, including entrenching biodiversity declines. That the limitations and fishhooks are many and multi-dimensional is no secret to those who design or decide on offset or compensation proposals. However, we considered it was important to explore these challenges and the risks associated with poorly designed schemes to highlight the need for caution. To retain focus on our key messages and potential pathways for improved practice within the current environment, we have appended this material (refer to Appendices 2–5).

[7] Sometimes referred to as 'aggregated schemes', here we categorise schemes that pool offset or compensation measures from individual (and unrelated projects) for the purposes of achieving greater outcomes collectively than they can individually as 'combined schemes'. We prefer this terminology to ensure a clear distinction between strategic schemes where combining (aggregating) offset actions has the potential for positive outcomes, and the use of more aggregated currencies (to describe and quantify losses and gains to determine ecological equivalence and offset requirements), which has potential for reduced outcomes for biodiversity by increasing the risk for concealed trades.

In undertaking our evaluation and compiling this report, the following topics, although highly pertinent to biodiversity offsetting, were identified but considered out of scope:

- A global review of biobanking.
- Discussion on the limits of offsetting.
- Carbon offsetting, emissions trading, carbon credits or the interplay between carbon and biodiversity offsetting.
- Cultural perspectives on, or mātauranga Māori contributions to, biodiversity offsetting and compensation.
- Detailed implications of current policy and legislative reform.
- Discussions on how to better facilitate trade-offs between development and biodiversity.
- Shifting the economic system or use of economic incentives or disincentives.
- Detailed discussion or evaluation of metrics, currencies, multipliers, or accounting systems.
- Iwi consultation.
- Setting targets or identifying attributes for targets.
- Describing the degrading processes that can be targeted with offset and compensation measures to generate biodiversity gains.
- Calculation of ecosystem service provision within an offsetting framework.
- Explicit reference to aquatic or marine offsetting (although many of the fundamental principles and concepts discussed here will apply).
- Discussion on the extent of empirical evidence demonstrating whether biodiversity offsetting or compensation works.

However, we note many of these topics have been well traversed elsewhere[8], or are worthy topics for further research (see Section 6). We also note the emerging concept of 'net positive'[9] which seeks to increase expectations and performance to generate positive impacts across all dimensions of sustainability (cultural, environment, social, and economic). Net positive concepts and actions are therefore independent of, and broader than, effects management, but we anticipate important interplay and influence in the future. There are certainly echoes of net positive concepts in increasing expectations around 'duty to enhance' and net gain offsetting. However, as the scope of this report is in the realm of biodiversity offsetting and compensation, we do not address this further here.

We note that given resource management legislative reform, and the progression of guidance development by central government currently in progress, we anticipate that this document will to some degree inform council's internal decision-making in the interim and inform the reform process. Thus, the intended audience for this report is both local government (ecologists, planners, policy analysts, monitoring and compliance staff) working in any way with biodiversity offsetting and compensation and central government. We also hope that this report will identify key areas where central and local government need to better coordinate effort to bring about improved outcomes for indigenous biodiversity.

[8] See Appendix 6 for a list of suggested further reading.

[9] For example, Net Positive Project (www.netpositiveproject.org).

2. ARE WE READY FOR STRATEGIC MECHANISMS?

2.1. Why investigate the use of strategic mechanisms?

Current implementation of offsetting and compensation is mostly characterised by individual approaches, at the site-by-site level, with little or no oversight by regulators. Attempting to resolve difficulties encountered in offsetting and compensation (e.g., determining an appropriate metric of exchange, locating or securing appropriate sites) are also tackled time and again on a project-by-project basis. Strategic mechanisms promise to reduce these difficulties while improving biodiversity outcomes from offsetting and compensation.

The potential benefits and risks of implementing strategic mechanisms for delivery of offset and compensation actions are set out in Table 1.

Table 1: Potential benefits and risks or limitations of strategic mechanisms for delivering offset and compensation actions.

Potential benefits	Potential risks or limitations
• Facilitates landscape, population, connectivity, and whole-ecology planning, rather than typically small-scale, piece-meal approaches. • Provide increased certainty around expectations of offsetting or compensation requirements. • Provide increased certainty regarding anticipated biodiversity outcomes (e.g., what, how much, when). • Can reduce ecological risk by securing credits (biodiversity gains)[10] in advance of losses. • Can reduce transaction costs. • Shifts the responsibility of delivery (including monitoring, reporting, and contingency) onto the owner of the scheme, an advantage for the consent holder. • Can potentially incentivise a particular desired biodiversity outcome (or focus on target biodiversity elements) with or without directive policy or legislation. • Increased transparency of what is being offset for what, and ability to compare between offsets and jurisdictions.	• Resource heavy to establish, implement, and audit. • A high level of knowledge and information is required but which is typically lacking across many councils' jurisdictions (particularly on private land). For example, state and trend data across biota and ecological domains, information on biota-specific response to management interventions, clear understanding of biota-specific targets to ensure persistence of indigenous biodiversity representation and enhancement of ecological processes and patterns at the landscape-scale. • For efficiency, strategic mechanisms necessitate simple measures, yet much of biodiversity is complex. This means either that schemes can only be used for a small portion of biota that can adequately be described and quantified with simple measures, or schemes can only be used to provide compensation outcomes and not net gain biodiversity offsets, as simple measures cannot adequately or appropriately account for complex, threatened, rare, uncommon, or less well understood attributes of biodiversity. • Increasing flexibility for exchanges (e.g., spatial proximity) can shift outcomes from no net loss (or net gain) offsets to compensation outcomes at individual project-level and scheme-level outcomes. • Although it is strategically sensible to align delivery schemes with existing projects and/or policy directions and initiatives, doing so can make additionality of gains attributable to the scheme difficult to demonstrate and achieve unless formally recognised up front.

[10] Biodiversity credits represent a quantified gain in the target element of biodiversity. Thus, the number of credits required to be secured for individual projects must be sufficient to fully balance the losses due to the impact of the project. Credits are generated through management actions that improve biodiversity (e.g., actions that restore, enhance, establish, and protect target biodiversity) and which would not otherwise have occurred.

Potential benefits	Potential risks or limitations
	• Are likely to be insufficient to fully address all more than minor residual adverse effects from a project and therefore additional offset or compensation actions will still be required. • As the responsibility for the delivery of the required amount of offset (or agreed compensation) shifts from the consent holder to the owner of the scheme, accurately costing participation in the scheme is crucial, yet challenging. Shortfalls become an issue for the owner of the scheme (and potentially compromise biodiversity outcomes). • Regulation is a key component in the successful performance of offsetting markets; the lack of compulsion can potentially further limit the market (i.e., no buyers) or limit the ability to effectively deliver conservation gains across aggregate users of the scheme. • Legal issues of accountability and liability for delivery of legal consent requirements through third-party providers have yet to be identified and any uncertainties resolved.

2.2. Are we running before we can walk?

Fundamentally, strategic mechanisms (of any form) do not replace the requirement to avoid, minimise, or remedy adverse impacts prior to the consideration of offsetting or compensation measures. Indeed, there is a clear recognition internationally that biodiversity offsetting is best suited to species or ecosystems that are common or well understood. Offsetting is less well suited to biodiversity values that are irreplaceable and vulnerable (Pilgrim et al. 2013; Gardner et al. 2013). In any case, legislation is tightening the ability to apply offsetting across the board, with clear indications at a national[11] and regional level[12] that some specific aspects of indigenous biodiversity should be avoided in the first instance. Such restrictions will also need to be considered within the context of a strategic offset or compensation scheme.

Reviews[13] of international offset policies and programmes provide a clear indication of generally poor performance when implementing effective offsets on the ground, and the challenges that are involved with developing a comprehensive, robust and transparent framework for strategic offsetting that will deliver no net loss or net gain outcomes. These challenges are pertinent to New Zealand, because several of the constraining factors identified from studies overseas are accentuated by New Zealand's much smaller potential market for offsets, and because we have yet to fully address these in any sort of comprehensive local or regional system.

Key challenges that we have identified are summarised in Section 3.2 (and the accompanying Appendices). Overcoming challenges is fundamental to ensuring that offsetting delivers lasting, equitable, equivalent benefits. This is a critical first step, without which formal strategic mechanisms, including biodiversity banking or offsetting in advance, cannot be expected to successfully contribute to achieving biodiversity policies, objectives and targets.

The current approach to offsetting in New Zealand is, for the large part, to let the user/ proponent drive the identification of offset sites and to provide guidance and 'rules' around the quantification of biodiversity losses and gains, with some limited guidance governing directly equivalent exchanges. Moving to a strategic approach would highlight tensions that would need to be effectively resolved before a strategic approach operating independently of, and at a much broader context than, individual proponents, is implemented.

These tensions include:

- Locating offset sites locally to satisfy ecological, social, and cultural ideals of spatial proximity, versus locating offset sites distant from impact sites to meet equivalence tests, and to help meet minimum funding thresholds for activating offset management. Such trade-offs should not be made in the absence of a through risk analysis as to the potential implications from an ecological, social and cultural perspective.
- Maintaining strict like-for-like equivalence in exchanges versus relaxing offset equivalence criteria or accepting compensation trades to enable funding thresholds or minimum viable management areas at

[11] For example, the National Policy Statement for Freshwater Management 2020, and the 2022 Exposure Draft of the National Policy Statement for Indigenous Biodiversity.

[12] For example, Principle 2 of the Natural Resources Plan for the Wellington Region and supporting documentation (Crisp & Oliver 2022).

[13] See Coker et al. 2018 and references therein. Yu et al. 2022 provide an extensive list of biodiversity offsetting publications.

offset sites to be satisfied. As for spatial considerations, increasing flexibility in exchange rules should not occur in the absence of a through risk analysis as to the potential implications for biodiversity protection and social and cultural considerations.

- The temptation to increase flexibility in offset exchanges and thus expand the market. Doing so interferes with messaging about scarcity of biodiversity elements and the importance of avoiding impacts in the first instance and can undermine no net loss or net gain objectives (zu Ermgassen et al. 2020).
- Financial contributions that allow a proponent to transfer accountability for an offset to a third-party versus requiring proponents to directly undertake and achieve the legal requirements of the approved offset. Evidence from overseas indicates that financial payments can result in under-achievement at offset sites if payments are not adequately calculated to ensure that offset gains are created and maintained for the legally required duration.
- The desire for a regulator or offset programme manager to commence on-the-ground offsets work versus the need to consider constraints on acceptance of offset offers because of inappropriate exchanges, inadequate funding to reach a given management trigger threshold, whether an offset programme should be assisted by public funding (and how), and the relative importance of maintaining stated guidelines for maintaining social and cultural equity through spatial proximity.

New Zealand lacks a formal national framework for offsetting, meaning that policy, technical guidance and practice around offsetting and compensation varies widely between jurisdictions, experts, and individual projects. Resolving the above tensions as part of developing or declaring a strategic approach to offsetting is essential as doing so will set a de facto standard for whether the generally accepted principles around offsetting that are currently being adopted into regional policies and national policy statements will be adhered to under a more strategic framework.

2.3. Alternative strategic actions to improve outcomes for biodiversity

There are additional (non-market based) approaches that can be considered strategic in the sense they aim to minimise risk and improve outcomes for biodiversity by targeting offset or compensation actions to specific, pre-determined locations or specific elements of biodiversity; or structuring consent conditions and using third party agreements. Such mechanisms are discussed in the 2018 Guidance document. In addition, we also suggest that focus in the following areas would contribute to improving biodiversity outcomes where offsets and compensation are used:

1. Adherence with the effects management hierarchy; including increased endeavours to avoid in the first instance.
2. Improving practice in effects management, including increasing capacity and capability within councils to assess resource consent applications and biodiversity offset or compensation proposals.
3. Improved design of offset or compensation proposals, including demonstration of estimated outcomes and transparency of supporting documentation.
4. Clear and consistent communication and guidance from councils to applicants as to regional priorities (including effects to be avoided in the first instance) and expectations will be fundamental to improving

practice. Such guidance should include fact sheets detailing and formalising expectations and processes associated with proposing an offset or compensation, including measures offered in advance of project commencement (see section 5).

5. Improved processes for dealing with applications for variations to consent conditions associated with effects management requirements.
6. Increased compliance monitoring and reporting of offset and compensation measures, and use of trigger consent conditions, staged conditions, and clearly defined contingency measures.
7. Establishment of a publicly available and spatial database of mitigation, offset, and compensation measures that is linked to projects, estimated outcomes, consented requirements, and monitoring results.
8. Investment in collection and analysis of good biodiversity data across the board.
9. Clearly communicated, biota-specific targets[14] that are incorporated into biodiversity policy and strategy documents, and monitoring and reported against.
10. Review the scope of Permitted Activities that contribute to biodiversity decline and loss.
11. Continued efforts for nationally consistent policies for biodiversity offsetting and compensation across all domains.

2.3.1 Spatially strategic offsets

Outside of a formal market, councils can encourage applicants to locate offsets at a specific location(s) to achieve spatially strategic outcomes . For example:

- To extend or provide connections with existing indigenous vegetation and biodiversity values.
- To provide additional biodiversity gains into existing biodiversity enhancement programmes.
- Take into consideration broader, landscape-scale considerations in terms of avoiding further declines in the future and/or increasing resilience at a landscape-scale.
- To maintain or enhance natural capital, ecosystem function, and provision of ecosystem services.
- Provide for social and cultural considerations.

This retains the applicant's responsibility for the design and implementation of the offset while providing councils with the opportunity to proactively encourage applicants as to where they locate their offset(s). In this way, the impacts from discreet activities can be offset by measures that are implemented at the same location, or adjacent to previous offsets on a project-by-project basis (Figure 1).

[14] See for example Simmonds et al. 2019.

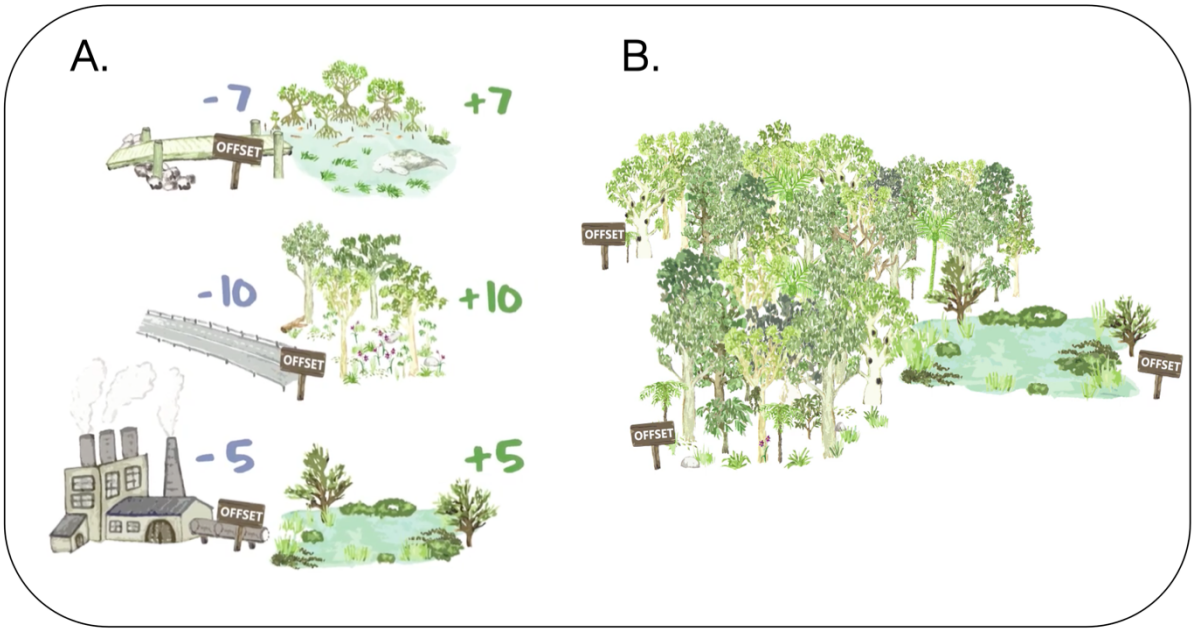

Figure 1: Conceptual illustration of spatially strategic offset location. Panel A represents three separate projects and associated offsets; Panel B illustrates how discrete offset requirements can be spatially consolidated to generate broader and greater gains. Figure adapted from screen shots taken from the IUCN IMEC video series on biodiversity offsetting[15].

Caution is still required to ensure that any attempts to spatially locate offsets do not serve as a vehicle to increase flexibility in exchange rules ('equivalence'). Principles of landscape context, stakeholder interests, and social and cultural considerations when locating either offsets or compensation should not be overlooked in the interests of spatially aggregating offsets. There is considerable temptation to relax rules to increase availability of potential offset or compensation sites; often argued for on the basis that it provides opportunities to generate 'better biodiversity outcomes.' For example, relaxing in-kind or better requirements or permitting greater geographical flexibility in locating offset or compensation actions are all challenges or requests that have been made by applicants and considered by councils when engaging with biodiversity offsetting. These challenges are as relevant to informal initiatives as they are formal schemes.

2.4. Conclusions and recommendations

In considering the development and implementation of local strategic mechanisms, a regulator needs to:

- Determine the need to identify many dozens of individual offset sites within socially and/or culturally determined spatial areas (i.e., replicate sites of many types of distinct biodiversity and/or ecosystems across a region to cater for local impact projects).
- Determine the extent to which a proposed sites and actions must satisfy all of the principles of offsetting to qualify as a valid offset within the scheme.
- Manage the likely small number of projects wishing to access a strategic offset market – without unintentionally creating expectations around acceptability of offsetting rather than an emphasis on

[15] http://www.impactmitigation.org/videos/v7-spatially-strategic-offsets. Accessed 15 August 2022.

avoidance of effects, and without relaxing fundamental offsetting good practice and incentivising compensation over offsetting.

- Balance the need to achieve a minimum fund threshold to enable meaningful enhancement work on the ground with the potential for individual impact project offset needs to generate insubstantial funding.
- Balance the need for a scheme to accumulate funds or offset sites to plan and implement comprehensive offset measures with need to implement consenting requirements relating to offsetting or compensation immediately or soon after granting of consent.

In our opinion, even if the technical aspects of identifying an ideal number of offset sites in each spatial location that cover the fullest range of ecosystems or species likely to be required for offsetting purposes can be achieved, the small size of an active offset market in New Zealand is likely to create difficulties in adhering to good or accepted offset practice when considering a strategic regional or local approach led by government.

A very real risk is that a strategic offset programme set up to deliver like-for-like offsets that meets good practice instead becomes a compensation programme that delivers biodiversity benefits but does not ensure that the loss of special ecological features for which the offset was designed are fully replaced and accounted for. Embracing compensation across the board (either implicitly or explicitly) will merely result in an acceleration of the loss of rare or threatened species or ecosystems and reinforce existing perceptions in New Zealand and internationally that biodiversity offsetting is risky, unproven, and does not result in good outcomes for conservation. In both these regards, we consider that the premature establishment of formalised strategic mechanisms will not improve on the status quo and may serve to entrench poor practice.

The barriers of a small market and possible constraints on funding streams from offsetting will limit the ability of even small projects to commence and sustain the momentum and on-the-ground deliverables.

The barriers are not insurmountable, but would require a strategic offsets programme coordinating body (whether that be local government or other public entity) and concerted effort to first address issues such as:

1. How much adherence is given to spatial proximity – does strategic offsetting that may not be in close proximity outweigh the potential permanent loss of biodiversity values to the community and ecosystems near the point of impact? How does this provide for social considerations, provide for rights and interests of iwi and hapū, or take into account mātauranga Māori?
2. Will a strategic enhancement location be only for the purposes of offsetting, or will a location receive resourcing from public funding (rates?), volunteer inputs, business contributions, or other resourcing not related to offset payments? This may assist with a minimum management threshold being reached sooner; however, it may reduce the range of offset opportunities at a given site.
3. If an offset financial contribution fund is created as a means of a consent holder discharging their offset (or compensation) obligations, how will adequacy of funding be ensured, and how will use of those funds in a timely and appropriate manner (following offset principles for example) be guaranteed? (See Section 4).
4. Formal strategic mechanisms of the necessary standard to ensure net gain offset outcomes have high ecological information requirements of the scope and resolution currently lacking across much of the

country and will be resource heavy to establish. Can the level of institutional investment required be justified if the usage of the scheme is low (that is, few trades)?

5. There is a high risk that regional-level strategic approaches will lead to paralysis, poor performance, and a lack of action on the ground, due to concessions to good offsetting practice and incentives driven by market mechanisms. Can the effort and establishment of institutional structures and systems needed to support these mechanisms be justified given these risks?

6. How will an offset manager track the use of sites across a scheme – the standards and implementation of an offsets register need to be described and set up in advance to maintain the integrity of the programme, and to demonstrate individual project compliance so that collective net gain is achieved.

Several of the above issues also apply to project-by-project offset and compensation proposals. We reiterate that if strategic mechanisms cannot improve on the status quo there is little justification in pursuing them. This is particularly true where there is the risk that they may bring about worse outcomes (e.g., facilitating compensation over offsetting).

3. WHERE ARE WE AT?

3.1. Current policy framework

Much remains the same since the publication of the 2018 Guidance in that there is no legislative requirement that specifically compels an offset, and we still lack a consistent, national policy framework across all ecological domains.[16] However, there have been several developments since 2018 which are shifting the policy context for biodiversity offsetting and compensation. These include:

- The effects management hierarchy, aquatic offsetting and aquatic compensation were introduced into the National Policy Statement for Freshwater Management 2020 (NPS-FM 2020).
- The resource management reforms (RM reforms) to repeal the RMA and replace it with three new pieces of legislation – Natural and Built Environments Act (NBA), Spatial Planning Act (SPA), Climate Adaptation Act (CAA).
- A Draft National Policy Statement for Indigenous Biodiversity (NPS-IB) was released in 2019 and an Exposure Draft released in June this year. Biodiversity offsetting and compensation were explicitly included in the 2019 Draft and retained in the 2022 Exposure Draft, although the requirement for offsetting has shifted from 'no net loss and preferably a net gain' in the 2019 Draft to 'net gain' in the 2022 Exposure Draft.
- The 2022 Exposure Draft of the amendments to the NPS-FM 2020 includes principles of aquatic offsetting and aquatic compensation.

The RM reforms are embryonic, and it is too early to comment here on implications for offsetting and compensation practice. Despite the current and emerging policy statements, consistent and coherent policy direction remains elusive. For example, the policy direction for offsetting or compensation of residual adverse

[16] See for example, section 1.2 of the 2018 Guidance.

effects on inland wetlands and waterways falls under the direction of the NPS-FM, while inland terrestrial biodiversity (excluding wetlands) falls under the (yet to be gazetted) NPS-IB, leaving a policy gap for coastal biodiversity and marine environments. The New Zealand Coastal Policy Statement 2010 (NZCPS) contains policies directing the avoidance of adverse effects on specified elements of indigenous biodiversity in the coastal environment, and significant adverse effects on other elements but does not provide direction on offsetting or compensation.

Further differentiation exists in the treatment of offsetting and compensation between the NPS-FM and the NPS-IB. For example:

- The NPS-IB requires a measurable 'net gain' outcome for biodiversity offsetting, whereas the NPS-FM retains a 'no net loss or preferably a net gain' outcome for aquatic offsetting. Both policy statements direct offsetting to be used to redress 'any more than minor residual adverse effects'.
- The principles for biodiversity offsetting set out in the NPS-IB must be complied with for an action to qualify as a biodiversity offset, and likewise for biodiversity compensation; whereas an applicant simply needs to 'have regard to' the principles for aquatic offsetting and aquatic compensation set out in the Exposure Draft of amendments to the NPS-FM 2020.
- The NPS-FM contains very clear policy direction that loss of natural inland wetlands and river beds are to be avoided. There is a stronger emphasis on management of effects rather than avoidance in the NPS-IB, with avoidance policies ringfenced for listed types of effects on identified significant natural areas (SNAs), provided these areas are not subject to stated exceptions.

Although not reflected in the NPS-FM 2020 Exposure Draft, the introduction of a 'net-gain' requirement of biodiversity offsetting in the NPS-IB Exposure Draft signals a shift in standards and expectations that reflects international developments[17] and a recognition that no net loss outcomes are not sufficient to address the dual climate and biodiversity crises[18], much less reverse the trend and shift to enhancement of natural capital and biodiversity.

It is against this context that we emphasise both the need to shift towards net-gain outcomes and the need for caution when contemplating the use of formalised regional-level strategic mechanisms so as not to unintentionally facilitate (or incentivise) compensation outcomes at the cost of achieving net-gain targets.

[17] For example, the UK Environment Act 2021 which requires almost all planning permissions granted in England from November 2023 to deliver a minimum of 10% biodiversity net gain (BNG), as measured using a standard metric and secured for at least 30 years.

[18] See for example, reports from IPBES and the IPCC and 2022 State of Environment report listed in Appendix 6.

3.2. Current practice

In preparing this think piece, we first reflected on the current practice of offsetting and compensation in New Zealand and evaluated the required structural settings for strategic mechanisms to be ecologically robust and economically feasible. Our findings are presented in Appendices 1–5, being:

1. The requirements and limitations of formal biobanking and an evaluation on whether the feasibility for biobanking in New Zealand has changed since the release of the 2017 report on biobanking published by the Environmental Defence Society[19]. (**Appendix 1**)
2. A review and evaluation of the success and adequacy of local-scale schemes designed to deliver biodiversity offsets or compensation. (**Appendix 2**)
3. Identification of the key components necessary for successful offset or compensation-delivery schemes and an evaluation of current practice against these components. (**Appendix 3**)
4. Factors currently limiting improved biodiversity outcomes from offset or compensation measures across policy, technical, and resourcing dimensions. (**Appendix 4)**
5. An evaluation of the lessons learnt[20] from the Australian National Audit Office report[21] in the context of designing and implementing strategic mechanisms for the delivery of offset and compensation actions. (**Appendix 5**)

From the above evaluations, and our experience, we conclude:

- There has been little, if any, change since the EDS 2017 report on biobanking, thus the feasibility for successful biobanking in New Zealand is still some way off. Therefore, we recommend that councils focus on other mechanisms to deliver more strategic outcomes from offsetting or compensation measures, rather than pinning hopes on a formal biobanking scheme operated regionally or nationally.
- Implementing formal top-down regional-level strategic mechanisms is high risk, may be unable to deliver like-for-like net gain biodiversity offsets, and on their own will not improve outcomes from compensation. Considerable work is concurrently required across all aspects of offsetting, including metrics and accounting systems, policy, consenting, and compliance monitoring and reporting to improve the delivery of agreed actions and to ensure that the resulting biodiversity benefits are appropriate, lasting, and are audited.

[19] Brown M 2017. Banking on biodiversity. The feasibility of biodiversity banking in New Zealand. Auckland, New Zealand: Environmental Defence Society.

[20] Gepp S, Wright M, Maseyk F, Doole M 2020. Possum in the headlights: An audit of Australia's biodiversity offsetting conditions and some lessons for New Zealand. Resource Management Journal August 2020:16–20.

[21] Australian National Audit Office 2020. Referrals, assessments, and approvals of controlled actions under the Environment Protection and Biodiversity Conservation Act 1999. Auditor-General Report No. 47 2019–20.

- The resourcing[22] required to establish, implement, and maintain strategic mechanisms is substantial. There is evidently a strong desire to 'do things better' in terms of offsetting and compensation, but it is less clear whether the demand would exist for formalised schemes that are adequately restrictive to ensure enhanced biodiversity outcomes. In the absence of this analysis, we cannot be certain that the benefit achieved would be worth the cost to establish and run such schemes with the rigour and to the standard required. Greater (and more immediate) gains may be made via other avenues, such as improved policy settings and stricter monitoring and compliance.
- Overly simplified or flexible schemes risk eroding standards of biodiversity protection and enhanced biodiversity outcomes where effects management measures are required by creating easier, cheaper, and inappropriate exchanges.
- There are several factors spanning political, policy, technical, and resourcing dimensions that are currently acting as barriers to achieving improved outcomes from biodiversity offsetting or compensation. We suggest these factors are not mutually exclusive and collectively are preventing improvements in practice, and consequently outcomes. Until these issues are resolved, and barriers removed, councils will not be able to make much progress in developing or implementing successful strategic mechanisms for delivering offsets or compensation. It is important to recognise that attempting to progress strategic mechanisms in the absence of addressing the underpinning limiting factors is attempting to run before you can walk. Until these are resolved, the current site-by-site application of offsetting driven by individuals will be the norm, and that will compound the current disparate approach to managing holistic gains and frustrate tracking quality, outcomes, compliance and efficiency at a district or regional level.

4. COMBINED FUND SCHEMES

Combining funds from individual and unrelated projects to deliver consolidated biodiversity offset and compensation measures that are informed by systematic conservation planning and prioritisation offers the potential for greater biodiversity outcomes. The combination of offsets and compensation measures can be via:

- A formalised, managed fund whereby, the consenting authority, or other third party, administers a codified scheme into which consent applicants pay a calculated amount of funding.
- Informal encouragement from the consenting authority to the applicant to seek opportunities in areas or for biodiversity attributes that align with regional priorities (see section 2.3.1).

In this section we focus on the formalised scheme, but reiterate that councils can encourage resource consent applicants seeking to propose an offset or compensation as part of their effects management package towards regional or local priorities provided that:

[22] This includes the required technical expertise to undertake assessments and calculate necessary credits. The lack of capacity and capability nationally to undertake ecological assessments, design and evaluate effects management packages (including offset and compensation proposals), and the lack of biodiversity data, were identified as key issues in feedback to MfE on the NPS-IB Exposure Draft. This mirrors the experience in England where a recent survey of local planning authorities identified key limitations to the implementation of emerging Biodiversity Net Gain policy as being lack of appropriate capacity and expertise, and baseline ecology information (Snell & Oxford 2021).

- The effects management hierarchy is applied in the first instance, and the seeking of offset and compensation options remain last steps in a staged response to effects.
- The principles and rigour associated with offsetting or compensation are applied.
- Doing so does not undermine or compromise other objectives or policies in council plans.
- Potential sites where additional biodiversity gains can be generated are available and able to be protected to the standard required of an offset or compensation (e.g., legal protection, in perpetuity, access for monitoring and management).
- Alternative proposals can also be considered on their merits.

4.1. What does a formal combined fund look like?

There are several characteristics that are central to a robust combined fund and are key considerations when considering the feasibility of establishing a fund:

- The contribution paid into the fund by applicants is of sufficient amount (year on year[23]) to generate and maintain appropriate biodiversity gains, accounting for time, risk, and uncertainty.
- Liability for delivery of the offset or compensation measures is transferred from the consent holder to the owner of the fund, including any shortfalls.
- The fund is used to deliver actions as necessary to secure tangible, additional biodiversity outcomes, ideally a specific type or element(s) of biodiversity (e.g., aquatic habitat, wetland extent).
- The fund, its stated purpose and targets, and outcomes should align with an identified biodiversity policy objective, and/or strategic plan and time-bound targets.

We describe the key components we recommend must be in place prior to commencing implementation of a combined fund in Table 2.

[23] The Australian experience indicates that the costs of generating gains is easy to under-estimate, particularly if not adjusted annually to account for market increases. Shortfalls in contributions to the fund result in shortfalls in achieving the necessary biodiversity gains (EIANZ National Biodiversity Offsets Conference, Canberra 25–28 July 2022).

Table 2: Key components needed for the establishment and sustained administration of a combined fund to achieve improved biodiversity outcomes.

Key component	Explanation
Participation only in accordance with application of the effects management hierarchy	Constraints for participation in the scheme need to be in place to ensure the effects management hierarchy (including avoid) has been appropriately applied in the first instance, and to provide clear expectations about which aspect of the residual adverse effects of a project are being addressed by participation in the scheme and which are not.
Explicitly stated purpose	The purpose and application of the scheme is clearly defined and transparent. This includes the target biodiversity attribute (what, where, by when) and clear link to biodiversity objectives and policies.
Clear understanding of the availability of target biodiversity and enhancement potential	The availability of each type of biodiversity to be exchanged (i.e., the credits) needs to be assessed against its enhancement potential and the number of credits available to trade decided upon.
Clarity on roles and responsibilities	Clearly defined roles and responsibilities for all parties (including the consent applicant, offset or compensation suppliers, and administrative agencies).
Target-based goals	*Scheme-scale:* Clearly defined, quantified, and time-bound goals are in place for each of the biodiversity elements that are targeted by the scheme. These goals will collectively describe the anticipated *additional* biodiversity gains attributable to the scheme.
	Project scale: The objective for the target biodiversity elements is explicitly described (e.g., net gain, no net loss, or compensation) and where net gain or no net loss is claimed, can be reasonably demonstrated (as per consenting requirements and good practice loss:gain evaluation). That is, participation in the scheme is to facilitate delivery of outcomes, not to undermine good effects management.
Additionality	Transparent and defensible description of how gains delivered by the scheme are additional to all other biodiversity enhancement initiatives. Those delivered by the scheme can be complimentary to spatially align with or expand on existing or required actions (outcomes that will be achieved anyway in the absence of the scheme). Detailed description of funding structure (including administrative costs) should be included in the scheme prospectus to provide transparency that cost shifting is being avoided.

Key component	Explanation
Spatially planned	The location for measures delivered by the scheme is determined by a spatial plan as ecologically relevant to the target biodiversity elements and scheme goals. A spatial plan provides the ability for combined actions from numerous consents to be targeted towards the same or adjoining location, or across landscapes as ecologically, socially, and culturally relevant to the target biodiversity elements. Systematic conservation planning will require a high level of information including state and trend data at a resolution relevant to the target biodiversity elements.
Sufficient market size	There is a high level of confidence that there is both sufficient participants and sufficient actions and sites to generate necessary additional biodiversity gains to achieve the stated goals of the scheme for the target biodiversity elements.
Motivation for participation exists	Regulation creates compulsion and therefore demand for the market. In the absence of regulation (or compulsion to engage in the scheme within a regulatory framework), other motivators need to be present and sustained (e.g., corporate responsibility; drivers for more sustainable development; and managing risk (Davies et al. 2021)).
Monitoring & reporting	Processes for timely monitoring and reporting and independent audit are established. Appropriate checks and balances are in place to ensure credits are not being double-sold and anticipated outcomes are achieved.

4.1.2. Limitations and risks of using combined fund schemes

A combined fund cannot be an ad-hoc undertaking, it needs structure and rigour, and this is true even if the fund is specifically designed for compensation (rather than net-gain offset) outcomes.

There are several considerations and challenges that a potential fund manager needs to resolve to avoid a fund intended to deliver offset outcomes becoming one that facilitates compensation trades, and to avoid a net loss of the biodiversity elements for which redress was intended.

Combined fund schemes require a simple metric to enable biodiversity gains to be converted to purchasable credits. They also require sites that provide additional like-for-like exchanges which can be brought into the scheme in a timely fashion. These two factors do not serve rare, threatened, or uncommon elements of biodiversity or the complexity of ecological processes well. We therefore suggest that combined fund schemes are faced with some very high hurdles if they are to be a viable mechanism to delivery biodiversity net-gain offset outcomes, and are more suited to simple, common, and easily replicated components of biodiversity. Further, as a combined fund consolidates payments from developers to be spent on biodiversity enhancement works (rather than matching buyers and sellers of like credits as in biobanking), it is difficult to ensure delivery of offsets at the project-level (Figure 2).

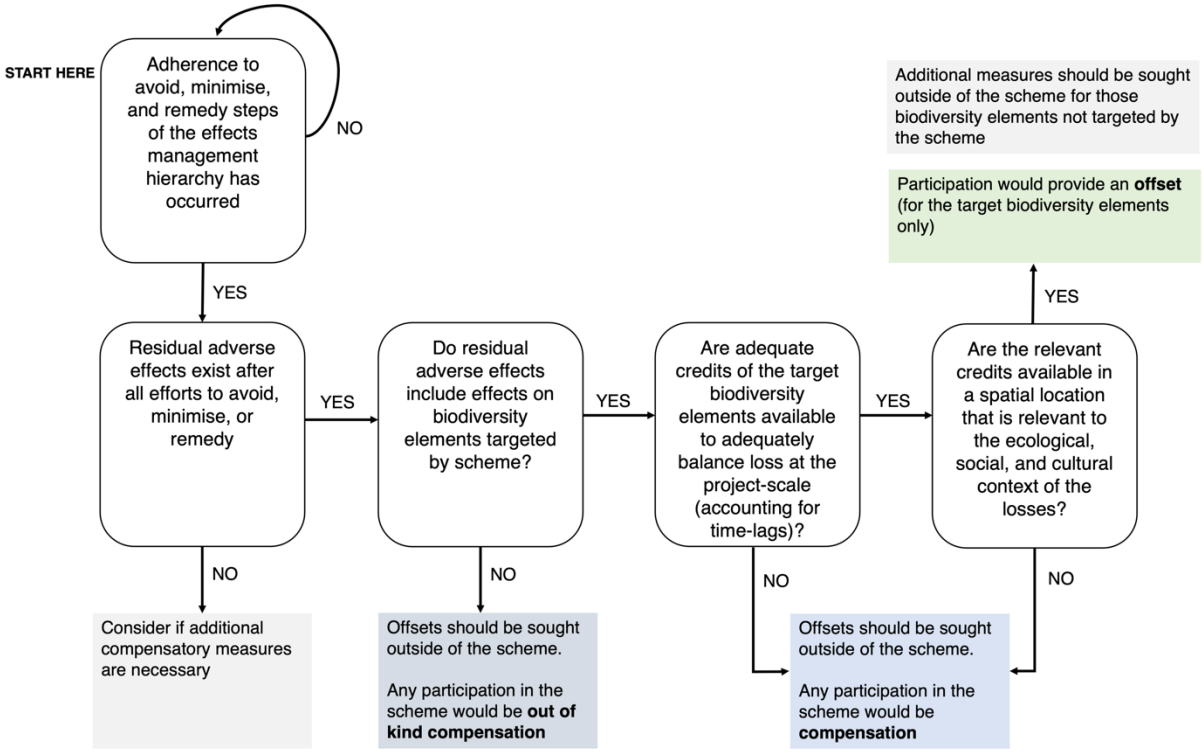

Figure 2: Conceptual illustration of whether participation in a (hypothetical) combined fund scheme would result in offset or compensation outcomes for an individual project. This conceptualisation focuses only on ecological equivalence and spatial context for simplicity, although these are not the only factors to be considered. It is assumed that any combined fund would be underpinned by a series of prerequisites (e.g., that only residual adverse effects are eligible to be addressed via the fund after appropriate measures to avoid, minimise, and remedy have first been exhausted, and that funds are only spent on generating additional biodiversity gains.

There are inherent risks and contradictions in creating and promoting a 'user-friendly' scheme that is more than likely to deliver compensation outcomes. Such schemes can (intentionally or otherwise) favour participation in the scheme over prioritising avoidance in the first instance followed by considering offsetting prior to compensation as follows best practice application of the effects management hierarchy. The contradiction between this outcome and council (and national policies) aiming at net gain need to be carefully considered and transparently communicated.

Additionally, combined funds require a minimum of funding and continued deposits to be self-sustaining, including the cost to develop a strategic plan, assessment of projects, and the yearly cost of implementing the works. By necessity, councils would need to have significant resources invested in the scheme. Consequently, the existence of a combined fund scheme can inadvertently result in councils relaxing policies around avoidance and net gain offsetting in favour of sustaining the scheme.

A final, and by no means insubstantial, limitation of combined fund schemes is the risk of not attracting enough of a market to sustain the minimum funding threshold required. That is, a financial gap between deposits into the scheme and the annual cost to deliver the required actions to deliver the outcomes sought. The consequences of that can undermine the intention of the scheme, run contrary to policy, and entrench losses of the biodiversity (Table 3).

Table 3: Potential responses to undersubscribed combined fund schemes, and potential risks to both biodiversity and council that could eventuate as a result.

Response 1: Fund remains undersubscribed	Response 2: Contributions to fund pro-actively sought	Response 3: Fund subsidised by ratepayers
Actions to generate biodiversity gains not implemented; Potential for previous measures to be compromised if cannot be maintained year to year; Anticipated biodiversity gains are not achieved; Biodiversity losses remain unaddressed	Proactively favours development effects over avoidance; Greater willingness to accept increased flexibility in trade to enable contribution to fund, thus favouring compensation over offsetting; Council-facilitated biodiversity losses; Undermines policies and objectives	Shifts onus for addressing adverse effects from applicants (those benefiting from biodiversity loss) to ratepayers; Sustainability of fund and biodiversity outcomes become susceptible to political willingness to accept cost-shift year to year; Reduced certainty that losses will be addressed

For these reasons we recommend that combined fund schemes are used with caution, are designed with the considerations set out here in mind, are accompanied by strict rules and transparent auditing and communication of outcomes, and do not claim to deliver more than they do.

5. PROVIDING BIODIVERSITY OFFSETS OR COMPENSATION IN ADVANCE

Biodiversity offsets or compensation provided in advance refers to actions that are implemented in anticipation of, but prior to, residual effects that will occur as a result of a specific activity planned for the future.

Offsets or compensation provided in advance can be distinguished from biobanking (the credits of which are also secured in advance of the impact) because of the following:

- There is no formal market-based instrument whereby debits (biodiversity impacts due to development) and credits (biodiversity gains generated for the purpose of trading) can be exchanged. *Biobanking requires a formal, codified scheme to oversee transactions (exchanges of biodiversity).*
- There is an explicit in-project link between the credit created in advance and the debit it is intended to offset or compensate for[24]. That is, the credits are generated with a specific project and associated impacts in mind, and they are only generated (and used) for that specific project. *Biobanking schemes include sites and biodiversity gains generated and banked for the general purpose of providing offsets or compensation for unspecified projects in the future (although once credits are drawn down, they are linked to specific projects).*
- The liability for the offset or compensation is not shifted away from the party causing the effect[25]. *Biobanking involves a third-party agency to facilitate and oversee the transaction.*

Offset and compensation actions which an applicant has already undertaken or started in advance of an application being lodged can be considered under s104(1(ab) of the RMA[26]. However, current practice reflects a hesitation around their use and provides no guarantees for the consent applicant that this investment will be recognised at the time a consent application is lodged. Indeed, it has been our experience that:

- Regulators tend to be reluctant to engage in conversations around agreeing in principle to acknowledge sites set up and provided for advanced offsetting. This has been the case even where such a mechanism would be restricted in use to a sole proponent and for unavoidable impacts and low-risk enhancements with which regulators have experience in more traditional impact-offsets sites.
- Applicants can have trouble obtaining consistent guidance from councils or experts on the ability of regulators to consider offsetting in advance, or any useful information around how it can be undertaken.

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[24] This requires baseline recording of the condition of the offset site (at the time it is secured and registered for the purposes of providing an offset or compensation measure for a future project), to enable a comparison with condition at the time of impact at the project site. This is to determine the amount of credit (biodiversity gain) needed to be provided in advance. This gain is used to balance impacts, measured at the impact site at the time of impact. Both impact and offset sites can be expressed relative to a benchmark.

[25] Usually, it will be the same party who both establishes the offset in advance (possibly by contracting its creation to another party) and undertakes the activity leading to the adverse effects on biodiversity.

[26] Which provides that a council can have regard to 'any measure proposed or agreed to by the applicant for the purpose of ensuring positive effects on the environment to offset or compensate for any adverse effects on the environment that will or may result from allowing the activity'.

- There is a lack of clarity in the standard of information that should be provided with an application to that includes the provision of offsets or compensation in advance, especially the legal status of work undertaken in advance.[27]

On the other hand, there is often a lack of surety for consenting agencies and the community that residual adverse impacts on biodiversity will be adequately balanced or advance outcomes for biodiversity achieved as claimed.

Despite the current challenges, we consider that there are potentially advantages for biodiversity in providing offsets or compensation in advance. In particular, the commencement of positive actions prior to the impact occurring and the ability to measure and confirm that actions taken to generate biodiversity gains are tracking as anticipated. This creates greater certainty that the required biodiversity gains will eventually be generated and reflects a level of commitment by the applicant. The provision of offset or compensation measures in advance will be most useful for large-scale projects that can be strategic over long timeframes. They will also be useful where the proponent has a vested interest in setting up and undertaking biodiversity enhancement works at scale and managing this for a timeframe that may be longer-than-normal under standard resource consent conditions for offsets that follow impacts.

Providing offset or compensation measures in advance is perhaps best conceptualised by all parties as 'getting a head start' rather than discharging effects management obligations at the time of consent lodgement. For example, allowing for the provision of measures in advance cannot result in an expectation that an area of 5-year-old plantings of early successional species is automatically adequate to offset loss of mature vegetation communities even if the planted area is larger than the area of vegetation lost. Loss:gain evaluations are therefore still required.

5.1. Overcoming current challenges in providing offset measures in advance

Considering offset proposals possibly a long time prior to applications being lodged is a substantial shift from current process and practice, and the required transparent and traceable process that can extend beyond typical timelines and election cycles is not yet in place. This issue sits across all other challenges and will need to be resolved if providing offset measures in advance is to be a feasible option for applicants. However, we consider it a relatively easy issue to resolve as – with council commitment – systems and processes can be established as required.

We set out these challenges below and provide potential solutions for overcoming these challenges, building on material presented in the 2018 Guidance document.

[27] This issue also holds for applicants wishing to combine offset or compensation sites, including as part of a project initiated by others.

Challenge: *Lack of mechanisms to recognise offset measures provided in advance*

Offsets measures provided in advance need to be recognised as such and therefore distinguishable from the 'existing environment'[28].

Solution:

Offset or compensation actions provided in advance which are explicitly linked to a future activity are more likely to meet the 'additionality' test and not be considered as part of the existing environment at the time the application is lodged. This is a good thing, as it provides for whatever ecological gains follow from those planned actions to be recognised and 'count' towards being on offset or compensation.

A formal Memorandum of Understanding (MOU) between future applicant and consenting agency should be prepared, which includes:

- A description (including spatial information) of the measures taken and gains anticipated and the intention to use these forecast gains as offset or compensation in the future.
- Acknowledgement from the Council that the work is being done in connection with a specific identified future activity and does not form part of the existing environment.

Acknowledgement from the applicant that the provision of an offset or compensation in advance does not and cannot constrain a consenting agency in exercising its normal powers and discretions when deciding on a resource consent application. That is, a commitment by an applicant to undertake works in advance does not assume approval of a future consent application. The MOU would then form part of the consent application.

Challenge: *Managing expectations*

Investing in offset measures in advance can create expectations that:

- The initial steps in the effects management hierarchy can be skipped at the time of impact.
- Biodiversity losses will be automatically allowed.
- The final consent application as lodged at some point in the future will be granted regardless – despite councils not having seen or assessed the final application at the time offset measures are initiated and therefore not realistically being able to pre-determine if these measures are appropriate.

Solution:

Ultimately, any effects management actions must meet the normal tests and principles, including the application of the effects management hierarchy. For offset measures provided in advance, this requirement is not dissolved and would be applied at the time of the application; such that the adequacy of the biodiversity gains generated from the measures taken in advance would be assessed against the residual adverse effects from the project. We recommend that councils develop specific policy direction for offset measures provided in

[28] The 'existing environment' is the environment as it exists at the time a particular application is considered, and which forms the baseline against which the effects of the proposed activity will be assessed (Quality Planning 2022; EIANZ 2018). In the context of providing offset measures in advance, any creation or enhancment of biodiversity values that occurs as a result of such measures should not become part of the baseline against which the values identification, effects assessment, and loss:gain calucations are conducted.

advance with the requirement for the effects management hierarchy to be applied (including efforts to avoid effects) at the time of application.

In addition to policy direction, expectations can also be managed via the MOU by including:

- Commitment to adhere to the effects management hierarchy, with an emphasis on avoid, at the time of designing the project and lodging a consent application.
- Acknowledgement from the applicant that the provision of an offset or compensation in advance does not and cannot constrain a consenting agency in exercising its normal powers and discretions when deciding on a resource consent application.
- Acknowledgement that additional offset (or compensation) measures may be required because of the loss:gain calculations and evaluation of adequacy of the effects management package (taking into account any gains accrued from measures taken in advance).

Challenge*: Investment risk*

The magnitude of the biodiversity losses are unlikely to have been evaluated at the time of implementing the offset measures, thus while the amount of gain required can be loosely estimated it cannot be quantified until fuller assessments are done at the time of the application. This represents a risk from the applicant's perspective of over or under investment.

Solution:

This requires willingness on the part of the applicant to take this risk. The recommended MOU will ensure the expectations of both parties are clear from the outset.

Challenge*: Lack of strategic direction*

Unless otherwise directed by an existing spatial plan for biodiversity management, offsets in advance are likely to be undertaken in places that best suits the proponent in terms of land availability and ownership, cost, and proximity to impact site. Location may not be the best or even the most preferred from a strategic landscape-scale conservation perspective.

Solution:

Direction from the consenting authority as to placement of an offset in advance is advantageous. That may require the pre-existence of a strategic regional offsets/ biodiversity enhancement plan. The development of a regional plan has potential synergies with the spatial plans proposed under the Spatial Planning Act.

Challenge*: Accounting mechanism*

There is currently little understanding or recognition through the offset calculation process for offsets provided in advance. This can have a significant effect where reduced risk and uncertainty of delivery of benefits results in considerably less offset quantum needed to achieve no net loss compared to the usual impact-then-offset scenario.

Solution:

Acknowledge that offsets in advance should attract benefits in terms of lower replacement multipliers or annualised discount rates tailored to the duration that enhancement exists prior to the loss of biodiversity values at an impact site. This is relatively straight-forward and would simply involve adjusting the standard risk and time lag multipliers to suit.

To facilitate the provision of offset or compensation measures offered in advance we recommend that:

1. Councils adopt an explicit policy to provide for the provision of offset or compensation measures in advance. For example[29]:

   An offset which is provided (at least in part) in advance of an application for resource consent, cannot circumvent application of the effects management hierarchy and 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 to the point in time of application for consent.

   iii. The offset measures generate gains in the same target biota as will be impacted by the proposed activity.

   iv. Additional offset actions are proposed where an evaluation of the biodiversity gain achieved under the offset provided in advance is shown to be inadequate to achieve [no net loss / net gain] of indigenous biodiversity values.

   v. The application demonstrates how the requirements of the biodiversity offsetting framework set out in [schedule appended to the plan] will be addressed, including adherence with the principles of offsetting.

2. Councils and applicants commit to early and formal engagement.

3. MOU are used to set out expectations and requirements to provide transparency of arrangements for all parties and stakeholders outside of the MOU parties.

[29] Adapted from Policy 3(d) set out in the Appendix to the 2018 Guidance.

6. FURTHER WORK

There is considerable background work that needs to be in place prior to establishing strategic mechanisms to ensure that these mechanisms do not circumvent application of the effects management hierarchy or result in worse outcomes than the status quo. It is evident from our analysis that there is much further work to be done to improve biodiversity offsetting and compensation practice and biodiversity outcomes regardless of the approach taken for the delivery of offset measures. We suggest[30] this scope of further work should include:

- Undertaking a more detailed opportunity assessment and statutory alignment with the forthcoming resource management reform, which was beyond the scope of this report.
- Investigating options to shift to a 'net positive' model[31] for all elements of indigenous biodiversity, including contributions from resource-users and developers towards enhancement and restoration of biodiversity and natural capital prior to consideration of effects management. This would also require a review of permitted activities across planning documents, and consideration of the implications for supply and demand within a mandatory biodiversity offset market if effects that would otherwise be permitted become subject to the effects management hierarchy.
- Conducting a survey of potential buyers and sellers to determine the likely demand for a biobank. Should demand be demonstrated, comprehensive research into the feasibility, design, and implementation requirements and regulatory system will then need to be undertaken.
- Incorporating consideration of natural capital and the sustained or enhanced provision of ecosystem services into biodiversity offset exchanges; including how to describe and measure these losses and gains alongside biodiversity attributes.
- The interplay between biodiversity offsets and carbon offset markets in the New Zealand context, and additionality challenges if selling into both markets.
- The use of mātauranga Māori-informed metrics and measures in loss:gain calculations and mātauranga Māori-informed decision-making (including target attributes and restoration goals).

[30] This list has been informed by our own experiences and the identified need as expressed via the review process (v1 draft report).

[31] Or similar concepts such as abundance models like He Ara Tuku Rau (Te Mata Pūau & The Catalyst Group 2022).

GLOSSARY

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

2018 Guidance refers to Biodiversity Offsetting under the Resource Management Act. A guidance document (Maseyk et al. 2018).

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 or compensation occurring).

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.

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.

Biodiversity offsetting principles / aquatic offsetting principles set out the framework for the design and use of offsets and which collectively describe the required standard for offsetting. The principles cover technical, social, cultural and policy matters.

Biodiversity compensation principles / aquatic compensation principles set out the framework for the design and use of compensation and which collectively describe the expected standard for compensation. The principles cover technical, social, cultural and policy matters.

Credits (biodiversity credits) are the common unit of measure used in banking schemes. Credits are generated through management actions that improve biodiversity (e.g., actions that restore, enhance, establish, and protect target biodiversity) and which would not otherwise have occurred.

Compensation (ecological compensation, 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.

Compensation site is the area or site when compensation actions are implemented, and which generates the additional biodiversity gains. A single compensation proposal might include several compensation sites.

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.

Ecosystem services are the benefits flowing from natural capital consumed or used by humans to sustain or advance wellbeing. This includes the goods generated by ecosystems that people value.

Effects management hierarchy (internationally the mitigation hierarchy) refers to the set of steps applied sequentially that seeks to, in order of prior application, avoid adverse effects, minimise adverse effects that cannot be avoided, remedy adverse effects that cannot be minimised, offset any more than minor residual adverse effects that cannot be avoided, minimised, or remedied, and compensate any more than minor residual adverse effects that cannot be demonstrably offset.

Like-for-like is the concept of comparing the same type of biodiversity when evaluating a no net loss or net gain biodiversity offset exchange.

Natural capital is the abiotic and biotic elements of nature, including all natural resources (such as soil, water, vegetation, species) and physical, biological, and chemical processes.

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.

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.

Offset site is the area or site when offset actions are implemented and which generates the additional biodiversity gains required to balance biodiversity losses. A single offset proposal might include several offset sites.

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APPENDIX ONE:

Biobanking in New Zealand

Biobanking, alternatively known as habitat/species banking is a market-based instrument with a range of operating rules for the trading of biodiversity values and delivery of impact management requirements. Biobanking treats offsets as assets that can be traded, creating a market system for developers' compensation liabilities.

The critical elements of biobanking are:

- An organised market which allows for trading of offset or compensation actions to redress adverse effects.
- The trade of biodiversity gains (credits) and losses (debits) are usually accompanied by payments.
- The person causing the effect is not normally the same as the person providing the credit. Indeed, there may never need to be a relationship between the two, although there would be contractual arrangements between the buyer, the seller, and the banker (administrator of the biobanking scheme).
- The credit need not be designed to match a specific debit at the time it is created.

The purchase of a credit usually transfers the liability for securing the offset outcomes from the person creating the impact (debit) to the person providing the biodiversity gain (credit).

A1.1 Fundamental limitations of biobanking

The concept of biobanking (local or national schemes) can be appealing as a mechanism to reduce transaction fees and increase the certainty of biodiversity exchanges. However, biobanking has inherent, intractable challenges that limit the potential for it to fundamentally resolve issues associated with offsetting or compensation and to improve biodiversity outcomes.

Markets function best with simple measures. However, the complexity of biodiversity means there is no simple (or single) currency that covers all components of biodiversity, including pattern and process, making biodiversity both difficult and expensive to describe and measure. The choice is often to either provide a means to set aside requirements of equivalent trades (i.e., make biodiversity truly fungible across species and ecosystems), or require a complex programme that attempts to separate and trade each distinguishable piece of biodiversity to meet offset principles requiring the conservation of distinctiveness. Biodiversity is the least amenable of all environmental commodities to manage via a market. This issue is fundamental and insurmountable, and thus the extent to which biobanking schemes can deliver biodiversity outcomes needs to be well understood by those administering any such scheme and clearly articulated to potential participants in the scheme.

However, biobanking does hold some potential to improve specific biodiversity outcomes where:

- The target biodiversity element(s) are well described and defined, and data for the target biodiversity element is readily available or easily collected.

- The goals to be achieved via a biobanking scheme (e.g., how much, of what, by when) are clearly stated.
- Eligibility for participation in the scheme is clear.
- The emphasis is on facilitating appropriate quality of biodiversity exchanges such that commitments to restore, enhance and protect biodiversity at an offset site are carried through in their entirety, not solely based on reducing the costs of the exchange.

The risks of creating a market mechanism for trading biodiversity, and not keeping focus on the above ideals is laid bare in the recent report of the Environment Protection and Biodiversity Protection Act in Australia[32] (Australian National Audit Office 2020), which included a review of biodiversity offset systems that have been part of the Australian approach to managing impacts on the environment for several decades (see also Appendix 5 of this report for further analysis).

Fundamentally, biobanking schemes cannot operate in the absence of supporting institutional systems, and processes. We caution against establishing a biobanking scheme (local or national) until these institution settings are in place. The design of a biobanking scheme must also include the necessary sustained resourcing and capacity to establish and implement the scheme. There is no system set up, or even seriously discussed, for New Zealand as a whole or individual regions that considers either the technical needs of a biobanking scheme or the administrative challenges of operating such a scheme.

A1.2. Update on 2017 biobanking report

The 2017 report on biobanking published by the Environmental Defence Society[33] included a review of the international experience of biobanking. That review identified eight key learnings from the international experience:

1. The importance of prescription.
2. Simple metrics conceal losses.
3. Restrictive markets discourage participation.
4. Expect to make changes in the early stages.
5. Compliance is an enduring challenge.
6. Regulatory drivers are the most secure basis.
7. Biobanking demands advanced gains.
8. Biodiversity necessitates transfer of liability.

[32] Australian National Audit Office 2020. Referrals, assessments and approvals of controlled actions under the Environment Protection and Biodiversity Conservation Act 1999. Auditor-General Report No. 47 2019-20.

[33] Brown M 2017. Banking on biodiversity. The feasibility of biodiversity banking in New Zealand. Auckland, New Zealand: Environmental Defence Society.

The review also identified that biobanking has the potential to improve the security of biodiversity gains and reduce transaction costs. However, the underlying context (including the regulatory framework) needs to be adequate to provide appropriate support and constraints for a biobanking scheme.

We re-visited the issues identified in the 2017 report to determine the extent to which the underlying context has changed (Table A1.1). The 2017 report also raises several key questions to be considered for a biobanking pilot scheme for New Zealand, which we note are yet to be answered.

Table A1.1: Evaluation of current status of underlying issues raised in the 2017 report 'Banking on biodiversity'.

Issue (as defined in the 2017 report)	Solution formulated	Solution Progressed	Issue Resolved
Importance of prescription *Opaque, voluntary schemes unlikely to safeguard biodiversity; prescription*	In small part. Some national standardisation of policy in relation to freshwater through NPS-FM (but standardisation in practice has not yet materialised). National direction remains lacking for terrestrial and marine biodiversity. Coherent and embedded national framework remains lacking.	No	No
Simple metrics conceal losses *Metrics that assume exchanging biodiversity is simple tend to enable poor exchanges, conceal losses, and exacerbate cumulative loss of unique biodiversity and environments*	No. Discussion and debate on appropriateness of various metrics and currencies for biodiversity exchanges continues. The inherent tension between markets requiring simple metrics and the risk to biodiversity in using simplified metrics and currencies as proxy measures of the complexities of biodiversity is intractable.	No	No
Restrictive markets discourage participation *A restrictive framework for biodiversity exchanges will inevitably create a thin market due to limited participation by both those providing credits and those wishing to purchase credits*	No. Increased flexibility in exchange rules (limits of offsetting, spatial considerations, ecological equivalence) increase risk to biodiversity outcomes and expediate less sustainable development, thus undermining one of the purposes of biodiversity offsetting (to provide equitable, equivalent replacement through lasting, additional biodiversity enhancements).	No	No

Issue (as defined in the 2017 report)	Solution formulated	Solution Progressed	Issue Resolved
Compliance is an enduring challenge *Weak implementation and poor compliance will undermine any scheme*	No. Compliance remains an issue and is under-resourced. Higher regulatory and reporting requirements add to transaction costs; however, reducing these continues to facilitate development at the cost of biodiversity protection and enhancement.	No	No
Regulatory drivers are the most secure basis *Voluntary involvement in conservation characterises New Zealand*	In small part. NPS-FM sets higher standard for outright protection, and mandates the use of the effects management hierarchy, including aquatic biodiversity offsetting. Indications for compulsion of offsetting and compensation are present in the draft proposed NPS-IB. RM reform potentially to compel more than current legislative and policy settings. Large envelope of permitted activities that impact on indigenous biodiversity and ecosystem function remain.	In small part NPS-FM	No
Biobanking demands advance gains *Credits need to be produced (at least in part) at the time of exchange*	No. (See **Section 5** provision of offset measures in advance)	No	No
Biobanking necessitates transfer of liability	No. Institutional and legal settings are still lacking to provide for transfer of liability. A biobanking scheme would require the administrative agency to incur liability, which in turn is reliant on strict audit and compliance to ensure the credits generated for the biobank scheme are maintained. (See **Section 3.1)**	No	No

APPENDIX TWO:

Review of local-scale schemes for strategic biodiversity offsetting or compensation

We reviewed examples and interviewed practitioners to assess offset banking or advanced offsetting schemes in New Zealand. Practitioners were ecologists who are involved in a broad cross-section of development sectors in New Zealand and who utilise offsetting under the RMA as part of their day-to-day business.

In most cases there is scant information on any underlying strategic approach to offsetting – almost all projects were reactive and took advantage of circumstances or discussions with regulators to explore ways of providing ecological redress that differed from the norm.

Most calls to experts for information on qualifying projects as examples of biobanking or advanced offsetting returned replies of 'no known examples'. Of the seven cases for which information was obtained, two were historic (before offsetting as a term was introduced to New Zealand) and six were developed and driven by individual proponents for specific projects (i.e., there was no wider application or strategic intent beyond the project-specific needs).

Four projects that proposed ecological enhancements in advance (predator control to assist long-tailed bats several decades in advance of quarrying operations, and planting of stream margins to replace values that would be lost through stream reclamation) did not progress beyond the conceptual stage. This was because no system existed for formally recognising offsets undertaken in advance, and that there was no guarantee that the regulator would or could consider enhancements generated prior to impacts being formally recorded i.e., additionality could not be guaranteed. In each case, the proponent abandoned plans for offsetting in advance and instead proposed a standard offset-following-impact model.

Two projects involved works undertaken well in advance of impacts. In one case, the revegetation planting work undertaken well in advance for the Transmission Gully Motorway project was considered in the Environment Court decision on the granted resource consents. In the other project, a stormwater treatment pond constructed as part of a motorway project four years prior to seeking permission to discharge stormwater into the structure was subsequently listed as a Significant Natural Area due to the rare birds using the constructed pond. The Applicant was informed by Council that it could not use the pond as intended, and this resulted in the advanced offset not being able to be used for its intended purpose (an alternative offset was offered instead).

Commonalities of these examples are:

1. Each developed an approach specifically for that project and the application seem to have been limited to that project.
2. There was no regulatory basis, or regional or national guidance to provide a technical benchmark for design – the design was informed solely by the expert ecologist advising the project.
3. There was no legal agreement written up to recognise the purpose for which the advanced ecological enhancement works were undertaken, and no willingness on the part of the regulator to engage in a novel process – which led to project proponents either abandoning the proposal at an early stage, or it

being a matter of luck whether the enhancement works were recognised by the regulator when it came time to propose means of balancing unavoidable adverse effects at the development site.

4. While several recent examples were supported by explicit loss:gain calculations, there was no progression of the proposals and therefore no opportunity to test concepts of reduced risk, uncertainty and time lags expressed through offset calculations; therefore, the conceptual basis for smaller replacement ratios being applied to offsets in advance remains untested.

5. The risk of the regulator accepting the enhancements in future as part of a legitimate offset involved more than minor risk of rejection. Risk of rejection because of failure to demonstrate additionality was a key factor in four of the projects abandoning offsetting in advance, and a key factor in one project having the advanced offset rejected in later years.

The last example is that of stream offset banking in Auckland through Auckland Council's Healthy Waters Biodiversity Offset Bank (the Bank). The Bank operates two programmes – the first, the Connect programme, is a match-making programme to pair willing applicants in need of streams with willing landowners with streams available for riparian planting. The second programme is the Enhance programme which operates as a banking scheme for stream enhancement credits that are paired with stream impact liabilities to provide for no net loss stream offset solutions based on loss:gain offset calculations to estimate credit requirements on a per-project basis.

Key components of the scheme include:

- The Bank pays for the investigation of the offset site – stormwater assessment, flood risk, ecology, management plans, and engineering needs, and recoups these costs as part of transactions.
- The offset works need to have obtained any relevant resource consents for enhancement works before offset credits are made available to projects.
- There is a Memorandum of Understanding between Council departments to ensure that proposed offset enhancements are valid and applicable to the land proposed as an offset.
- An application received for credits is matched to the right type and number of stream offset credits available and conditioned in the resource consent as an Augier condition[34], as a requirement for the consent holder to purchase.
- The work to enhance or restore the stream is undertaken by Council as the bank manager, funded by the sale of credits to consent holders.

[34] Where an applicant gives a clear and unequivocal undertaking and, relying on that undertaking, the local authority grants consent subject to a condition in terms broad enough to embrace the undertaking, the applicant cannot say later that there is no power to require compliance with the undertaking. This is called an "Augier" condition. Olsen v Auckland City Council [1998] NZRMA 66.

The scheme has been in operation only a short time. Preliminary reflections from those involved with the bank are:

1. There is a shortage of available offset sites. All projects to date are on Council-owned land.
2. There is a roughly 20% completion rate for enquiries by consent applicants through to sale and purchase agreements, with most drop-off relating to the price point of credits.
3. The Enhance programme commenced with a strategic view in mind and with a focus on daylighting culverted or piped streams. However, the high price of undertaking such works (and resultant high credit price) has resulted in downwards pressure such that the focus is now on less expensive credits generated through stream riparian planting.
4. The scheme was set up to be managed by administrative staff; however, operational needs have required ongoing input of scientific staff to advise on credit calculations and offset stream management.
5. The audit process for the scheme is yet to be finalised.
6. Due to the small number of applications to date, the focus has been on restoring ecologically meaningful stream reaches at specific sites through to completion, even if that inevitably means that there is great spatial separation between impact and offset site. Spatial proximity is less of a priority for the programme, at this stage; rather a focus has been on prioritising timely works on the ground to minimise time-lag delays, and to ensure that the SEV-ECR[35] method is followed in its entirety.

Overall, there are several general observations that can be made from this part of the work:

1. There are no comprehensive schemes operating in New Zealand that offer banking, trading, combined offsets, or offsets in advance in a coordinated central, regional or local level (although the Auckland Council scheme achieves most of these factors).
2. Almost all projects that we have been made aware of are driven by individual developer needs, rather than being developed, administered, and managed at a broader scale (e.g., local government, or third-party provider).
3. Ecological enhancement has been part of solutions offered for projects well before biodiversity offsetting and its guiding principles were seriously discussed in the New Zealand context (i.e., before 2014). Such 'ecological enhancement in advance' has been undertaken for only a few projects and at the time its use was considered 'novel'. 'Drawing down' those ecological benefits against impacts at a later stage has been problematic.
4. There is a strong desire among private companies to have a better system in place than the current piece-meal, project-by-project approach to offsetting. However, companies acknowledge that they

[35] The Stream Ecological Valuation (SEV) and associated Environmental Compensation Ratio (ECR) methods used to assess stream values at impact and potential offset sites (using the SEV) and to determine the quantum of necessary stream restoration required to provide no net loss of stream ecological function (informed by the ECR).
Storey RG, Neale MW, Rowe DK, Collier KJ, Hatton C, Joy M, Maxted J, Moore S, Parkyn S, Phillips N, Quinn J 2011. Stream Ecological Valuation (SEV): A revised method for assessing the ecological functions of Auckland Streams. Auckland Council Technical Report 2011/009.

cannot design or implement a scheme at scale in an effective or cost-efficient manner. There needs to at least be regional direction provided and a clear set of guiding principles and 'rules'.

5. One banking scheme that has recently started is operated by Auckland Council. Its operation is recent, and the scheme is still bedding in technical and logistical matters as part of testing a fully operational scheme. While offsetting principles and considerations of additionality, equivalence, auditability, and no net loss underpin the scheme, spatial proximity, some aspects of equivalence, and public transparency are not consistent with current recommended best practice.

Our impression is that private industry would be supportive of a scheme such as that offered by Auckland Council (offering combined offsets or a compensation scheme or a biobanking scheme) if one were made available, simple to use, and which is auditable and proven, simply because individuals are realising the real costs of undertaking offsets to the required standard on a project-by-project basis. The scheme operated by Auckland Council (The Bank) is focussed on stream offsetting only – not offsetting in regard to wetlands or indigenous vegetation types – and therefore operates in a simplified context compared to the requirements outlined in this report. In addition, the Auckland Council scheme does not adhere to strict like-for-like exchanges and does not adhere to requirements around closes proximity for offset sites. While private industry may be supportive of a scheme with an expanded scope as described above, there are still issues around equivalence and proximity that will need to be resolved if it is to operate as a 'bank' that meets all of the principles to qualify as an offset bank.

APPENDIX THREE:

Evaluation of current practice against components necessary for successful delivery of schemes

In response to the UK's forthcoming mandatory 'Biodiversity Net Gain' (BNG) as a condition of planning permission, The Nature Conservancy (TNC) has identified the key components for an effective BNG scheme within a regulatory framework[36]. The 20 components are grouped into three categories:

- What – foundations and ground rules (12)
- Who – delivery mechanisms and roles of all parties (2)
- How – disclosure and scheme administration (6)

While the requirements within each of these three categories have been identified by TNC as necessary to achieve net gain, we note the same requirements would be necessary for an offset delivery scheme that is seeking at least NNL, or a compensation delivery scheme that is seeking explicit ecological benefit greater than would otherwise be achieved. Thus, these scheme components and requirements can be used to evaluate the current practice in New Zealand (Table A3.1) to:

- Determine distance between current practice and where it needs to be, and thus feasibility of implementing strategic mechanisms in New Zealand in the short, medium or long-term.
- Key areas to focus to reduce gaps between current practice and desired practice.
- Potential barriers to successful implementation of combined offset and compensation schemes.

Existing guidance documents[37] cover many of the components detailed in Table A3.1, and several tools exist to assist decision-making at key stages of offset design. However, for the purposes of this evaluation we focused on current practice and legislative and institutional arrangements.

[36] The Nature Conservancy 2021. Biodiversity net gain in England. Developing effective market mechanisms. Discussion paper.

[37] For example, the 2018 biodiversity offsetting under the RMA guidance document and the 2014 New Zealand Government good practice offsetting guidance document.

Table A3.1: Evaluation of current practice against key requirements for offset delivery schemes. Components and requirements have been adapted from The Nature Conservancy (TNC 2021) for schemes aimed at generating a net gain in biodiversity, although the same components and requirements would be relevant for schemes aiming for no net loss. 'Current status' refers to current practice in New Zealand. Red squares = requirement not met or resolved; Brown diamonds = requirement partially, or inconsistently, meet or resolved; Green circles = requirement meet or resolved or is easily addressed during the design phase of an offset scheme.

Component	Requirements	Current status	Comment
WHAT: Foundations and ground rules			
Policy goal	Mandatory goals for outcomes (e.g., quantified net gain).		There is no national direction that covers all biodiversity domains; various (more recent) council policies include statements such as 'achieving no net loss, and preferably a net gain' but such statements are not supported by descriptions of what, compared to what, or by when, such that the goals remain opaque and inconsistent. The NPS-IB Exposure Draft explicitly includes a net gain goal for biodiversity offsetting, however the NPS-IB it is yet to be gazetted. The Exposure Draft of amendments to the NPS-FM 2020 retains the 'no net loss, and preferably a net gain' definition for aquatic offsets. The strict avoid regime of the NZCPS and absence of a no net loss objective, limits application of biodiversity offsetting in the Coastal Marine Area and Coastal Environment.
	Target-based goals for scheme that demonstrably contribute to regional targets.		Requires clearly stated targets and exchange rules to direct applicants when undertaking offset or compensation design, for example, when considering trading-up.
Policy scope	The types of developments, the scale of the impact, and the ecosystem elements to which the policy applies must be clearly defined.		All activities that have an impact on biodiversity that are not permitted activities are subject to the effects management hierarchy and therefore potentially the subject of offsets. However, plans are inconsistent as to the level of effect which requires

			an offset (e.g., all residual effects versus significant residual effects).
Availability of good quality biodiversity data	Good quality data is critical to being able to adopt a strategic approach and for providing certainty that specific actions will generate anticipated outcomes.		There are common, significant information gaps, particularly in species occupancy data, habitat condition, and state and trend data for terrestrial ecosystems. Access to existing information and data can be difficult. Where data does exist, it is not in a central database, it is typically accompanied by only minimal metadata, and it is frequently non-standardised. Outcome monitoring data from previous effects management interventions are scarce and poorly recorded.
Loss/gain calculations	Consistent and credible methods to quantify impacts and required biodiversity gains to meet policy goal offsets for different environmental domains.		Accounting systems are in use. However, considerable debate and uncertainty remains about the metrics and models that are appropriate and necessary. Ongoing confusion as to the role of loss/gain calculations within the wider offset design process. Loss/gain models are misconceived to provide 'the answer' and are thus easily criticised. Critically, currencies and metrics to determine ecological equivalency between disparate losses (individual impacts) and combined gains (via a scheme) are not in current use.

Exchange rules Ecological equivalence	Well-defined rules on what constitutes equivalence between residual development impacts and biodiversity gains achieved via offset or compensation actions, including for in-kind or out-of-kind exchanges.		No national policy that prescribes exchange rules or defines ecologically equivalent 'trading up'. Lack of biodiversity monitoring data and understanding of ecological function for many species or habitats to enable high level of certainty that exchanges of different biodiversity are adequate to ensure that 'trading up' will result in a biodiversity gain.

			Lack of understanding of the potential trade-offs of ecological processes and provision of ecosystem services when trading up amongst species (or habitats).
Mitigation hierarchy	Strict rules to ensure that resource-users adhere to the effects management hierarchy.		Wide variety between various planning documents with older documents less likely to contain requirements to adhere with the hierarchy. Policy documents are inconsistent in their emphasis on avoidance, mitigation, and use of qualifiers (e.g., 'where practicable' 'where possible') and are inconsistent with definitions of parts of the effects management hierarchy, leading to inconsistent application when applied for individual projects
Limits to offsetting	Explicit statement on: a) Values to be protected. b) Thresholds of unacceptable effects that must be avoided (no option for offset or compensation due to intolerability of impacts). c) Effects that are not offsetable (due to technical or social limits to offsetting) but which may be compensated for.		Most planning documents do not provide for specific limits to offsets, but some more recent ones do (e.g., the West Coast RPS, Greater Wellington RPS). The NPS-IB Exposure Draft requires that principles for biodiversity offsetting must be complied with, including a principle describing when biodiversity offsetting would not be appropriate. The examples (biodiversity is irreplaceable or vulnerable, effects are uncertain or little understood, there are no technically feasible options) within this principle reflect key aspects of limits to offsetting. A similar principle applies for biodiversity compensation. Similar principles for aquatic offsetting and compensation are included in the Exposure Draft of amendments to the NPS-FM 2020, although unlike the NPS-IB, there is no compulsion to comply with principles for aquatic biodiversity or compensation; rather the council simply has to be satisfied that the applicant has had 'regard to' the principles 'as appropriate'.

			Both Exposure Draft documents are yet to be gazetted.
Strategic spatial plan for biodiversity	The implementation of strategic spatial plans that prioritise potential offset/compensation sites in ecologically appropriate locations or locations that have been prioritised for conservation outcomes, can be used to enable offsets to contribute to wider biodiversity priorities.		Regional biodiversity strategies may identify high level priorities (e.g., ecosystems of interest) but do not spatially identify or prioritise sites for the purpose of: a) Avoiding impacts. b) Identifying suitable offset sites based on specific criteria. c) Strategic goal setting for conservation targets around protection, enhancement or biodiversity creation. There is also a potential opportunity to incorporate offsetting considerations in the spatial plans to eventuate under the proposed Strategic Planning Act.
Spatial delivery	The biodiversity domain (terrestrial, freshwater, marine) subject to exchanges is clearly defined.		The NPS-FM 2020 applies to aquatic offsets relating to wetlands and rivers. Terrestrial offsets are common practice in most areas and required by some plans, but there is no consistency. Should the NPS-IB be gazetted there may be improved consistency between councils. Not resolved in the marine environment.
	The scale (regional or local) to which the scheme applies is clearly stated, and the risks and benefits of operating a strategic offset approach at that scale are explicitly defined		Currently no national-scale scheme in existence. Regional plans that include offsets are implicitly applied to a regional context. No national or regional examples of risk or benefit analysis.
	The expected spatial proximity between losses (impact sites) and gains (offset/compensation sites) is clearly defined and appropriate for the relevant regulatory environment		Ongoing debate on the merits (or otherwise) of tight expectations of exchanges within tight spatial proximity, and trade-offs that occur when spatial proximity is prioritised. Lack of biodiversity data can reduce understanding of implications for target biodiversity element in increasing (or decreasing) spatial proximity between locations of losses.

			It is common to disregard spatial proximity in current practice (e.g., application of SEV can allow for offset sites that are some distance away and in different receiving environments than impact sites).
Additionality	Conservation actions included in a scheme to generate biodiversity gain must not be already required or mandated elsewhere, and their inclusion (or the scheme itself) cannot displace existing funding or implementation of those actions. Strict criteria describing the circumstances that specific existing actions/programmes can be included in the scheme without compromising additionality principles are required.		Ongoing confusion of which actions provide additional gains and how to avoid cost-shifting from existing conservation or mitigation efforts, although individual projects involve intense discussion, scrutiny, and application of additionality principle. No clear ability to consider biodiversity gains provided in advance of biodiversity losses due to current lack of a legislative basis supporting offsetting or compensation in advance. Currently lacking mandated exchange rules relating to averted loss offsets, or adequate data to estimate risk of future loss with sufficient certainty; thus, compromising additionality principles should averted loss offsets be used. Lack of biodiversity monitoring data further hampers ability to fully understand causal effect of regional policies, objectives, and interventions and separate these from outcomes attributable to offset or compensation actions. The risks associated with this issue are further compounded when actions are consolidated.
Duration/durability	Durability criteria are in place to ensure that offset measures are sufficiently long-lasting (e.g., gains persist at least for the duration of impacts).		Currently the duration of offset outcomes is addressed via conditions of consent for which there is no standard approach and duration of offset measures is often not the focus of discussion. The longevity of conditions of resource consents are often less than the period required to maintain offset interventions to sustain an offset (especially for pest control/ enhancement offsets or re-establishment of older forest beyond 35 years old). There is an assumption that offset sites will stay on a trajectory of biodiversity gain/benefit even after management has ceased.

			Lacking regional (or national) database logging offset sites risking offset sites being developed or 'reused' to offset further development in the future.
WHO: Offset delivery mechanisms and roles			
Offset delivery mechanisms	Institutional mechanisms through which offsets can be delivered are well defined. Clear rules outline when each mechanism can or cannot be deployed.		Offsetting and compensation in New Zealand remain dominated by case-by-case offset proposals associated with consent applications which vary in their approach, design, and outcome. Growing interest in more strategic and/or coordinated schemes is generating localised, targeted schemes overseen by consenting agencies (e.g., Auckland stream offsets); although the objective is NNL (preferably net gain) rather than requiring net gain, and the role of regional bodies to date has been more of 'match-maker' than administrator or proponent of a strategic, targeted approach.
Clear roles	Roles and responsibilities for all parties are clearly defined.		There is room for improvement in terms of oversight, compliance, transparency, and disclosure in consenting processes associated with offsetting and compensation (see also Appendix 2)
HOW: Disclosure and scheme administration			
Offset plans	Clear and comprehensive documentation of all steps of offset design; showing adherence to principles; detailing assumptions and data sources; justifying chosen biodiversity targets, and currencies anticipated outcomes; contingency plans and adaptive management measures etc.		Currently prepared as supporting documentation for resource consent applications. No mandated content in terms of scope or standard and offset proposals are variable in their quality, comprehensiveness, and transparency. Documentation often evolves through consenting processes resulting in several versions of offset documents in existence. Variations to conditions sought post granting of consent can further deviate implementation away from the agreed plan and undermine no net loss or net gain goals.

Administrative process and timelines	Process and timelines to determine how and when resource consent is granted and the commitment to an offset plan.		Consenting process and timeframes requirements are set out in the RMA. Commitment to an offset plan is reflected in consent conditions but see comments below (Monitoring and long-term reporting).
Monitoring and long-term reporting	Clear rules on how to report performance throughout implementation and long-term. management; including interim monitoring for tracking progress and implementing adaptive management approaches and contingency plans.		Consent monitoring is typically less than required, outcome monitoring and policy performance monitoring even less common. No region has dedicated resources to monitor and report on implementation of and outcomes from offset or compensation actions.
Enforcement	Well-articulated and effective enforcement mechanisms to prevent noncompliance.		Compliance monitoring and enforcement is variable and typically lacking nation-wide; leaving biodiversity outcomes dependent on good faith, and (from the few examples of post-implementation monitoring) undertaken not in accordance with agreed offset plans. Variations to conditions (including offset requirements) are not uncommon, reflecting a lack of commitment, or lack of communication over the importance of adherence to a project-specific agreed offset standard.
Offset tracking system	Transparent and publicly accessible systems for tracking offset demand, supply and transactions.		None currently available in New Zealand

The above evaluation highlights that the current offsetting and compensation environment in New Zealand precludes the ready establishment of a combined delivery scheme that operates on a multi-project or strategic regional or local level. Currently, even foundational components for the delivery of offsets or compensation are lacking in the necessary rigour (Table A3.2) to provide the necessary certainty that anticipated biodiversity outcomes will be achieved via strategic delivery mechanisms. The lack of any workable system to date means that New Zealand is currently beholden to site-by-site and project-by-project consideration of offsets and compensation – an approach that in many cases is not achieving no net loss at the regional-scale (due to permitted impact thresholds)[38] – and certainly not advancing concepts of strategic biodiversity management or a combined scheme targeted at delivery of offset or compensation outcomes.

Table A3.2: Summary of evaluation of current offset practice against requirements for an effective offset delivery scheme.

Status	Percentage by category (%) (Number in brackets)			Total (n =21)
	What (n = 14)	Who (n = 2)	How (n = 5)	
■ Requirement not met or resolved	36 (5)	50 (1)	60 (3)	43 (9)
◆ Requirement partially, or inconsistently, met or resolved	57 (8)	50 (1)	20 (1)	43 (9)
● Requirement met or resolved or is easily addressed during the design phase of an offset scheme	7 (1)	0	20 (1)	14 (3)

The same constraints apply at regional and national scales. However, while there is a clear need for national-level institutional arrangements, regional (or district councils) could initiate and implement delivery mechanisms that aim to improve biodiversity outcomes in the interim. The design of any such scheme would need to consider the current shortfalls in practice (as identified above) and make a concerted effort to overcome them.

[38] This issue is raised in the 2018 Guidance document.

APPENDIX FOUR:

Current limitations to improved biodiversity outcomes from offset or compensation measures

Table A4.1: Factors currently limiting improved biodiversity outcomes from offset or compensation measures across policy, technical, and resourcing dimensions. Unresolved, these limiting factors will prevent the success of strategic mechanisms.

Category	Limiting factors
Policy	New Zealand has not progressed in terms of goals within offsetting policies, which still reflect the 'no net loss and preferably a net gain' goal of the initial biodiversity offsetting settings (e.g., BBOP). However, with the current shift in national policy setting (e.g., NPS-IB Exposure Draft including a compulsory principle of net gain for biodiversity offsetting) and emphasis on avoiding impacts (i.e., NPS-FM 2020) it follows that offsetting goals reflect this. National and local offsetting and compensation policy continue to lack specific goals and objectives (i.e., what, of what, by when). Mechanisms for delivering offsets or compensation cannot be placed within a strategic framework when the goal is opaque. Net gain outcomes will not be achievable against a background of permissive policies that allow continued detrimental impacts on indigenous biodiversity (including elements of biodiversity that are of least conservation concern). Strategic mechanisms, especially those that risk incentivising compensation, must be considered in this context. **We recommend offsetting policies shift from 'duty of care' to 'duty to enhance' and that a net gain outcome be sought**. Specific targets (i.e., how much net gain of what by when) can be further described in line with local priorities.
	Many councils have biodiversity strategies in place, and it makes sense that these provide a good starting point to identify priorities. However, such strategies are typically general in terms of goals, and lack the specificity required for offsetting or compensation. Critically, they are also typically divorced from regulatory methods in regional and district plans and associated RMA planning processes and thus reflect a mismatch between stated regional objectives for biodiversity and practice (e.g., the continued suite of permitted activities, lenient consenting, lack of compliance). The same mismatch will occur if strategic mechanisms to deliver offsetting or compensation are used to contribute to regional objectives. To avoid this mismatch, background impacts (including permitted activities) occurring at the same geographical scale need to be accounted for within the required quantum of exchanges enabled through the mechanism. The NPS-IB Exposure Draft requirements for regional biodiversity strategies may result in greater integration of regulatory and non-regulatory methods for biodiversity management but will potentially continue to lack the specificity

Category	Limiting factors
	required for offsetting or compensation. Further, the collaborative approach required to develop regional strategies may result in goals that provide for continued land use practices rather than goals (and associated actions) that are required to halt and reverse biodiversity declines. **We recommend strategic approaches need to take a more coordinated approach across all of council outputs and be based on robust spatial conservation planning.**
Technical	Strategic conservation requires very good data and understanding of state and trends across multiple elements of biodiversity and across organisational levels (i.e., species, habitats, ecosystems). Strategic, target-based mechanisms for the delivery of offsets or compensation are no exception. **Availability, management, and coordination of biodiversity data needs to improve substantially, and regional councils are the logical agencies for this responsibility in relation to private property. Cross-agency agreements (e.g., between the Department of Conservation and local government) will need to be facilitated to allow for unhindered and timely sharing of data necessary for spatial conservation planning; state and trend analysis; and response of target biota to specific interventions.**
	Nationally, councils and applicants are still struggling with the fundamentals of offsetting and compensation. Until these more 'basic' issues are further resolved, it is overly ambitious to contemplate strategic mechanism or schemes as the same issues will manifest. **We highlight that it is not a matter of simply tinkering with delivery mechanisms to achieve needed improvements for offsetting and compensation, and effort will need to be focussed across all dimensions of improving effects management in parallel.**
	Additionality must be carefully defined for each site as the required, volunteered, or mandated baseline expectations around environmental quality and management can differ between sites. For example, formal protections or planning requirements such as fencing watercourses, excluding stock from vulnerable land, pre-exiting conservation covenants, requirements of existing consents, all influence the existing state of the environment and what actions are additional.

Category	Limiting factors
Resourcing	Effects management is very difficult and very expensive. Strategic approaches have the *potential* to improve outcomes (and perhaps limit transaction costs and some types of uncertainty) but they are not, nor should be, an 'easy' or 'cheap' alternative. They require substantial resourcing and commitment to run and audit; including regulatory capacity and political willingness to establish and sustain a scheme. **We recommend that should councils pursue strategic mechanisms for the delivery of offset or compensation proposals they adequately resource the administrative and governance structures required. This should be cost-neutral for councils and subsidisation of any scheme (and its users) avoided as making offsetting or compensation cheaper incentivises its use and disincentivises avoidance, thus perverting the underlying intention of biodiversity offsetting and compensation.**

APPENDIX FIVE:

Audit of the Australian Federal Government's management of biodiversity offsetting

In 2020, the Australian National Audit Office released a report[39] concluding that the Federal Department of Agriculture, Water and the Environment was under-performing in relation to administration and assessment of approvals of controlled actions (which may require biodiversity offsetting[40]) under the Environment Protection and Biodiversity Conservation Act 1999. Although Australia and New Zealand's policy and legislative settings for biodiversity offsetting and compensation are very different, there are some valuable lessons from the Australian audit that have relevance to New Zealand. Gepp et al. (2020) provided some initial comment to this effect and their conclusions provide useful flags to avoid similar shortfalls in implementing biodiversity offsetting or compensation schemes in New Zealand.

It is important to note that the process under the Australian EPBC Act applies to individual projects and associated offset proposals; not a scheme designed to combine offsets to achieve more strategic outcomes. However, the audit highlights several fundamental challenges with offsetting and compensation which, as we show above, are also yet to be addressed in New Zealand. The same issues hold when considering the feasibility and potential design of strategic mechanisms for delivering offsets or compensation.

The seven specific findings from the Australian audit that Gepp et al. (2020) considered to be relevant to, and have possible implications for, application of biodiversity offsetting in New Zealand are listed below (accompanied by a comment in the context of strategic offsets).

1. *Lack of linkage between desired environmental outcomes and determining the acceptability of environmental impact, and consequently no method of determining appropriateness of approval.*

   Desired outcomes from strategic schemes will need to be clearly stated and described beyond general no net loss or net gain statements. For example, explicit outcome statements that describe the goal, the target biodiversity element(s), and the timeframe. Clearly stated objectives will help inform the eligibility of potential purchasers of credits from a fund, or those providing financial input as a means of compensation payments. No scheme should be established that attempts to address impacts on elements of biodiversity which are unacceptable.

2. *Inadequate internal guidance established for the purposes of reviewing offsets and no quality assurance process in place.*

   Strategic schemes will need to be accompanied by audit and quality assurance processes, both to provide confidence to regulators and third-party auditors that the exchanges are appropriate and to ensure that the scheme is delivering the outcomes on the ground that were anticipated and paid for.

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[39] Australian National Audit Office 2020. Referrals, assessments, and approvals of controlled actions under the Environment Protection and Biodiversity Conservation Act 1999. Auditor-General Report No. 47 2019–20.

[40] All actions that may significantly impact nine matters of national environmental significance under the EPBC Act ('controlled actions'), must go through a referral, assessment, and approval (from the Minister of the Environment). Biodiversity offsets may be required as part of conditions of approval after avoidance and mitigation measures are taken.

As an example, the Auckland Council Biodiversity Offset Bank, as simply a 'match-making' scheme, does not have any checks or audit processes in place, and is not involved in the exchange or cross-party discussions. This makes it difficult to validate the exchange, and to confirm who has done what, where.

3. *No agreed method for estimating risk of future loss averted by the offset proposal.*

   Strategic mechanisms require robust, defensible, and transparent methods for estimating biodiversity gains attributable to specific actions, in the same way that project-by-project offsetting and compensation does. Using averted loss offsets as a method to achieve gains is not recommend both because of the inherent difficulties in accurately estimating the likelihood of future loss and as sites that would likely be a target for averted loss (of extent) offsets would themselves be subject to an offset (thus removing the risk of future loss and the ability to generate gains through protection[41]).

4. *Lack of system for mapping offset locations, risking the same area being claimed as an offset site more than once.*

   Comprehensive spatial information of an appropriate resolution will be required to link actions implemented under the scheme with specific projects that have bought into the scheme. Spatial information is also required to ensure the same areas/credits are only claimed once for the set of enhancement actions and outcomes.

5. *Increased flexibility in application of offset principles and exchange rules to overcome lack of availability of suitable offset sites.*

   A strategic scheme has the potential to reduce this risk by identifying and securing suitable offset sites for exchange via the scheme. However, there remain avenues where this could still be an issue for schemes. First, the finite availability of suitable offset sites could make it difficult to establish a scheme large enough to warrant it (i.e., achieve greater ecological outcomes than a project-by-project approach). Second, lack of availability of suitable offset sites could push mismatched projects towards participation in the scheme, increasing the dissimilarity between the impact and the gain. The former is a universal challenge, and the latter requires clearly defined criteria to determine eligibility for participation in the scheme.

6. *Lack of integrity in record keeping, monitoring, and enforcing of approvals.*

   This is an issue that is fundamental to the success of offset and compensation efforts across the board. Strategic schemes will be no different and must be subject to compliance monitoring and

   enforcement. The ongoing lack of adequate capability and capacity across councils for compliance monitoring and enforcement is a considerable hinderance to achieving greater ecological outcomes from offsetting and compensation.

[41] Maseyk FJF, Maron M, Gordon A, Bull JW, Evans MC 2020. Improving averted loss estimates for better biodiversity outcomes from offset exchanges. Oryx doi:10.1017/S0030605319000528.

7. *Lack of process for verifying satisfactory completion of the condition requirements relating to offsets.*

In summary, the key issues raised by the Australian audit with relevance to New Zealand, are yet to be resolved in a general sense. Further, the issues cannot be resolved simply via the use of strategic schemes to deliver offset or compensation measures. Indeed, doing so before these issues are resolved will merely accentuate or mask flaws and failures and make assessment of successful ecological redress and general biodiversity state and trends more, not less, opaque. Rather, the Australian audit aligns well with the identified requirements of delivery schemes set out in Table 2 and collectively provide sound justification for the need for rigorous systems and processes within, and in support of, strategic mechanisms.

APPENDIX SIX:

Additional resources

Further reading

Rather than replicate, this list of suggested readings is intended to complement and build off the reading list provided in the 2018 Guidance.

Abdo L, Griffin S, Kemp Annabeth, Coupland G 2021. Disparity in biodiversity offset regulation across Australia may reduce effectiveness. Australasian Journal of Environmental Management 28(2):81–103.

Brown MA, Stephens RTT, Peart R, Fedder B 2015. Vanishing Nature. Facing New Zealand's Biodiversity Crisis. Environmental Defence Society, Auckland.

Bull JW, Milner-Gulland EJ, Addison PFE, Arlidge WNS, Baker J, Brooks TM, Burgass MJ, Hinsley A, Maron M, Robinson JG, Sekhran N, Sinclair SP, Stuart SN, zu Ermgassen SOSE, Watson JEM 2019. Net positive outcomes for nature. Nature Ecology & Evolution 4:4–7 doi.org/10.1038/s41559-019-1022-z.

Department of Climate Change, Energy, the Environment and Water 2022. National Biodiversity Offsets Conference 2.0: Offsets reform workshops. EIANZ https://www.eianz.org/document/item/6636.

IPBES 2018. Summary for policymakers of the assessment report on land degradation and restoration of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. Bonn, Germany: IPBES Secretariat.

IPBES-IPCC 2021. Biodiversity and climate change. Scientific outcome of the co-sponsored workshop on biodiversity and climate change.

IPBES 2019. Global assessment report on biodiversity and ecosystem services. Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services Bonn, Germany: IPBES Secretariat.

Maron M, Juffe-Bignoli D, Krueger L, Kiesecker J, Kümpel NF, ten Kate K, Milner-Gulland EJ, Arlidge WNS, Booth H, Bull JW, Starkey M, Ekstrom JM, Strassburg B, Verburg PH, Watson JEM 2021. Setting robust biodiversity goals. Conservation Letters e12816.

Ministry for the Environment, Stats NZ 2022. Environment Aotearoa 2022. New Zealand's Environmental Reporting Series. Publication No. ME 1634. Wellington, New Zealand: Ministry for the Environment and Stats NZ.

Polman P, Winston A 2021. Net positive. How courageous companies thrive by giving more than they take. Massachusetts, USA: Harvard Business Review Press.

Sonter LJ, Gourevitch J, Koh I, Nicholson CC, Richardson LL, Schwartz AJ, Singh NK, Watson KB, Maron M, Ricketts TH 2018. Biodiversity offsets may miss opportunities to mitigate impacts on ecosystem services.

Walker S, Bellingham PJ, Kaine G, Richardson S, Greenhalgh S, Simcock R, Brown MA, Stephens T, Lee WG 2021. What effects must be avoided, remediated or mitigated to maintain indigenous biodiversity? New Zealand Journal of Ecology 45(2):3445.

Working Group 2021. Climate Change 2021 The physical science basis. Summary for policymakers. Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change.

zu Ermgassen SOSE, Baker J, Griffiths RA, Strange N, Struebig MJ, Bull JW 2021. The ecological outcomes of biodiversity offsets under "no net loss" policies: A global review. Conservation Letters e12664.

Further watching:

The Impact Mitigation and Ecological Compensation Thematic Group (IMEC), part of the IUCN Commission on Ecosystem Management videos on the concepts and challenges central to biodiversity offsetting and compensation. https://www.impactmitigation.org/videos

Recordings of the National Biodiversity Offsets Conference 2.0 held in Canberra 26–28 July 2022 https://vimeo.com/eianz

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