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Priorities For Public Investment

Related to Voluntary Biodiversity Credit Markets

Abstract

Nascent voluntary biodiversity credit markets (otherwise known as 'voluntary nature markets') operate globally and in Aotearoa New Zealand, promising sustained financial support for conservation initiatives from private investors. Voluntary biodiversity credit markets may operate independently of government, but their risks engage core government concerns, including protecting the public interest in a healthy environment. The optimal role of public investment in this context is contested. We suggest three priority areas for public investment: maintaining core conservation spending; investing in underlying spatial and ecological data; and promulgating and implementing regulatory safeguard mechanisms. Investment in avoiding or mitigating risks in market mechanisms should enjoy the same government attention as efforts to promote such mechanisms. Likewise, addressing the risks should be treated as core public infrastructure for any voluntary biodiversity market.

Keywords biodiversity credit market, public investment, nature market, voluntary market, conservation, market mechanisms

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The funding shortfall for conservation is becoming increasingly desperate, and the window of time to arrest declines in species and ecosystems is rapidly closing (UNEP, 2025). The case to boost investment in nature protection is powerful, including the economic case (WWF-New Zealand, 2024). New Zealand's internationally renowned biodiversity faces considerable threat, and mobilising efforts to address that threat have been significant nationwide. The efforts of government agencies (including councils), iwi and hapū, eco-sanctuaries, community conservation organisations (including catchment groups), private landowners and some businesses have been considerable. Thus far, however, the combined effort has struggled to stem the tide of loss, with a lack of sufficient resourcing and weak incentives being significant factors (Brown et al., 2015). The urgency of the biodiversity crisis continues, while funding falls shorter and shorter of what is required (WWF-New Zealand, 2026). The newly minted second implementation plan to support the Mana o te Taiao Biodiversity Strategy (Department of Conservation, 2026) promises little additional funding from public sources and an ever-higher reliance on private investment – assumed rather than secured.

Voluntary biodiversity credit markets for biodiversity (otherwise known as 'voluntary nature markets')[1] offer the prospect of additional funding for conservation, especially where conservation funding is tight. Not surprisingly, the allure of voluntary biodiversity credit markets has driven much discussion, debate and publicity, both in New Zealand and internationally. New Zealand's Ministry for the Environment has actively promoted the concept, including supporting and coordinating pilot programmes, releasing a suite of suggested integrity principles, and setting out the proposed role of government to support the 'scaling up' of investment (Ministry for the Environment, 2025).

Voluntary biodiversity credit markets promise many potential benefits, including biodiversity action on the ground that would not otherwise have occurred, enhanced opportunities for private land conservation, increased collaboration, spillover benefits from technological advances to support markets, and providing

A *biodiversity credit* is a certificate that represents a measured and evidence-based unit of positive biodiversity outcome that is durable and additional to what would have otherwise occurred (Biodiversity Credit Alliance, 2024).

Box 1 Integrity as a linchpin (with a focus on additionality)

Biodiversity gains that generate credits in a voluntary market must meet high integrity standards (World Economic Forum, 2025). Most important is that the gains are real and are additional. Further integrity issues may also arise where market activities and their objectives are inconsistent with te Tiriti o Waitangi obligations, tikanga, rangatiratanga and Māori data sovereignty (see Greenhalgh et al., 2026).

However, upholding integrity standards in a biodiversity credit market is extremely challenging. Determining whether actions are additional (i.e., the biodiversity gains would not have occurred anyway), ensuring permanence, and avoiding leakage (i.e., harmful activities moving elsewhere – see Wunder et al., 2025) can all pose challenges. Additionality poses especially tricky and non-trivial challenges for assessment because it involves predicting the future.

Buyers are likely to have trouble comparing the value of the biodiversity outcomes delivered and the longevity and security of different credits, especially where there are multiple different standards and frameworks in play. The complexity of biodiversity and the associated technical difficulties involved in measuring biodiversity make it difficult and costly to establish whether a conservation intervention has, in fact, made a positive difference to biodiversity on the ground. In addition, credits subject to rigorous monitoring to demonstrate positive biodiversity outcomes will likely be more expensive than those that are not, and thus potentially less competitive in a market where it is hard to distinguish what the 'true' gains are.

The inherent challenge of demonstrating 'additional and real' biodiversity gains combines in biodiversity credit markets with economic incentives for both buyers and sellers to favour less expensive credits. This can be seen where corporate buyers may be looking to enhance green credentials at low cost, and sellers have a financial incentive and the opportunity to select the cheapest land and/or the simplest conservation actions. In other words, biodiversity credit markets are vulnerable to 'adverse selection' (zu Ermgassen et al., 2023; Swinfield et al., 2024).

There is likely a direct relationship between the cost of a credit and the quality of the biodiversity gains delivered. Project proponents wishing to generate higher-quality credits that create more value for biodiversity and/or who invest in demonstrating that their credits have higher integrity are more likely to have higher-cost credits which are less competitive, simply because they involve more expensive actions. For example, the purchase of commercially valuable land that is truly at risk of development will be more expensive, but provide more value for biodiversity, than purchasing land at little risk of development. Similarly, the establishment of a new, permanently fenced sanctuary to exclude pests which requires long-term maintenance will be more expensive and valuable than trapping pests in an unfenced area where reinvasion is more likely.

Some potential implications for biodiversity where credits fail to maintain or meet integrity standards are:

- Protection of biodiversity that is under little threat of loss, or the creation of biodiversity elements that are already common. This risk emerges from cheaper or quicker actions that may make little difference to the status of biodiversity.
- Biodiversity gains are focused on actions that result in short-lived outcomes: e.g., predator control for birds where predator reinvasion and recovery are likely (and the permanence of gains is at risk).
- The harmful activity effecting biodiversity simply shifts elsewhere rather than ceasing (i.e., there is leakage; see Wunder et al., 2025)

The tensions and incentives in market mechanisms make integrity a linchpin of long-term success, especially where the gains are rarely comparable and the cost of conservation actions and value of biodiversity gains are highly variable. We highlight integrity as a matter of ongoing concern with market mechanisms which generate system-wide risks for conservation.

a means through which iwi and hapū can exercise kaitiakitanga. But internationally the promises of voluntary biodiversity credit markets have rarely been realised; many ventures have raised less funding than hoped and provided limited benefit for nature (Dempsey, 2025). Furthermore, upholding the integrity of voluntary biodiversity credit markets is particularly difficult (see Box 1). Therefore, there is justification to tread carefully and manage expectations in New Zealand.

Even if voluntary biodiversity credit markets result in few trades and make little difference to nature, they may still cause harm (Walker et al., 2025). Participants in markets may have little incentive or agency to take responsibility for the broader impacts of biodiversity credit markets on the public interest in a healthy environment. Government agencies often face competing critique as to their role and responsibility in this context. We highlight the role governments can take in providing assurance that public interest outcomes are achieved alongside commercial imperatives. We propose that clearly defining the role of governments in biodiversity credit markets will help to set expectations and to illuminate the potential risks that are not owned and are unlikely to be actively managed by market administrators and participants.

We focus on the ability of public investment to reduce the risk of biodiversity credit markets generating wider, system-level conservation risks. If unchecked, these risks could have long-term negative consequences for biodiversity and for the effectiveness and durability of a biodiversity credit market itself. We identify three areas where public investment can support safeguards for nature that may be compromised by market mechanisms. These include providing a robust conservation baseline, supporting better decision making around where and in what to invest, and lowering the potential risk of deceptive behaviour by market participants.

Table 1: Eight difficult problems for biodiversity credit markets

Markets predicated on damage and loss are risky for biodiversity.
Voluntary biodiversity markets may not attract substantial private investment.
Integrity principles for voluntary biodiversity markets will be difficult to meet.
Unintended and perverse outcomes are likely.
Adequate biodiversity currencies are neither simple nor easily measured.
Durable voluntary biodiversity markets will have high overhead and transaction costs.
New Zealand lacks appropriate underpinning biodiversity data and information.
Capacity and capability for designing and implementing a voluntary biodiversity market in New Zealand are poor.

Source: Walker et al., 2025

Table 2: Eight essential guardrails for biodiversity credit markets

1. Voluntary biodiversity credit markets are differentiated from biodiversity offset programmes and not used to compensate for harm to biodiversity.
2. Biodiversity credit funding is additional to sustained public investment in conservation.
3. Costs of participation in voluntary biodiversity credit markets are explicit and transparent.
4. High integrity standards protect market longevity.
5. National ecological information is improved, and guidance and advice are available to support projects.
6. Liability and consequences for non-delivery and reversals are clear from the outset.
7. Market oversight is sufficient to detect and address fraudulent claims and bad actors.
8. System stewardship supports oversight and monitoring of market transactions at scale.

Source: Greenhalgh et al., 2026

The state of play in biodiversity credit markets in New Zealand

In New Zealand, many conservation projects have experienced significant drops in funding in recent years, and there is an immediate need to address those practical resource gaps (Doole, 2024). Public spending has also substantially reduced (Parliamentary Commissioner for the Environment, 2025), despite ever more urgent conservation priorities as biodiversity loss continues apace because of ongoing environmental degradation (see, for example, Ministry for the Environment & Statistics New Zealand, 2025). Traditional funding sources such as donations, grants and contracts for services remain possible but can be time-intensive to secure and generally only provide short-term funding. Project proponents are sensibly looking for stable and enduring income streams, and the potential of voluntary biodiversity credits in that context has proved enticing, with a range of early experiments under way.

The experience in biodiversity credit markets is far more developed internationally than in New Zealand, and we drew on that experience in designing and assessing biodiversity credit markets to write two policy briefs, summarised in Tables 1 and 2. The first brief describes key problems that biodiversity credit market developers must tackle to ensure markets do not further harm biodiversity (Walker et al., 2025), and the second proposes a suite of guardrails to help guide the design and implementation of biodiversity credit markets (Greenhalgh et al., 2026).

The appropriate role of governments in biodiversity credit markets is a theme that has frequently arisen during discussions in New Zealand and elsewhere. Some commentators have suggested that governments have no role and should exit entirely or observe silently. Others have expectations of a significant interventionist role, in which governments set standards, manage transactions and undertake communications and marketing to promote the market. Still others expect significant public investment in market mechanisms themselves, even though many examples demonstrate that this may be a much less efficient way of achieving conservation outcomes than direct investment (Kedward et al., 2023). In voluntary markets for other environmental goods, such as carbon, governments are increasingly being asked to step in to clarify how these markets work alongside regulations or national commitments.

Here, we suggest that an approach midway between the 'hands off' and 'hands on' extremes may be sensible: government safeguards the broader long-term public interest in biodiversity and sets the expectations of how these markets operate,

Box 2 What is in and out of scope for biodiversity credit markets in this article

The term 'biodiversity credit market' has been used to describe a range of activities and mechanisms related to the use of private (and sometimes public) funding for conservation purposes. In this article, we are referring to additional biodiversity gains that generate credits for purchase by private investors on a voluntary basis.

This article does not consider non-voluntary actions, such as biodiversity offsets and compensation and other regulatory requirements, as candidates for a voluntary biodiversity credit market. We also note that many transactions that superficially resemble market activity are, in reality, traditional grants and sponsorship, and are better supported by complementary conservation mechanisms, not a market mechanism.

There are also cases where actions are taken to maintain existing areas of indigenous biodiversity, or to continue existing programmes (such as predator trapping), particularly at a small scale. These actions are likely to struggle to meet objective criteria for additionality. Again, these actions are likely better supported by complementary conservation mechanisms, not a market mechanism.

Credit markets are only one way that private and public support can be directed at conservation initiatives. Governments may play important roles in enabling complementary conservation mechanisms, alongside their role in biodiversity credit markets. This is an important rationale behind the need to maintain public investment in conservation actions.

while the mechanics of the market are left to market developers. We also suggest that public investment should be directed at least equally between efforts to mitigate and manage the risks associated with markets, and promoting market mechanisms and supporting their proliferation. Our focus is purely on voluntary markets (see Box 2); compliance markets would justify different interventions.

Three focus areas for public investment

Government at all levels, science institutions, universities, NGOs, private companies and other entities play different roles in addressing the potential risks associated with biodiversity credit markets. These roles include, for example, the development of integrity standards, registries, biodiversity measurement methodologies and monitoring models. Some roles, however, fall more naturally to government than others. We focus on three areas for public investment related to biodiversity credit markets, and these are where other parties are unlikely to have the means, incentives and/or authority to undertake the role substantially. These are:

- maintenance of existing public investment in conservation, including strategic oversight and prioritisation;
- procurement and maintenance of underlying spatial and ecological data to support quality decision making for those participating in biodiversity credit markets;
- promulgation, introduction and/or use of mechanisms to manage the risk of bad actors and fraudulent claims in biodiversity credit markets.

Focus area 1: Maintenance of existing public investment in conservation, including strategic oversight and prioritisation

Public investment is critical to conservation outcomes over the long term as it is inherently more stable than private investment, less vulnerable to the whims of the market and better able to account for distributional impacts of investment (Kedward et al., 2022). The case to maintain and increase public investment in nature is strong, particularly where synergistic objectives such as combating the impacts of climate change, reducing erosion and maintaining biodiversity are considered together.

Biodiversity credit markets, regardless of scale, may result in the pre-emptive withdrawal of public funding for conservation. Withdrawing or reducing public funding may have a variety of effects relevant to credit transactions, including undermining the additionality of new investment, compromising the value of credits sold, and missing important opportunities for cohesive and strategic conservation approaches at scale.

Potential new funding for conservation where there is a withdrawal of public monies ('cost shifting') presents a problem of simple arithmetic. Private or philanthropic sources intended to help bridge the funding gap will make little difference if public investment is reduced in response to their presence. It is therefore important that existing public investment is maintained and that private investment (actual or assumed) is not permitted to 'crowd out' public investment (Biodiversity Credit Alliance, 2025).

Conservation is increasingly multipolar, but not all participants have the same moral and regulatory authority, core intentions or obligations. Public agencies have a leadership role in protecting public goods and ensuring a strong foundation for further conservation investment. Cost shifting may not only undermine conservation but also tarnish any market as an investment prospect if investors do not see evidence of wider biodiversity gains.

Managing the risk of voluntary biodiversity credit markets displacing public investment requires strategic and holistic management, including, among other things, to:

- resist the temptation to shift the cost of conservation from the public to the market, particularly before additional expected income from market mechanisms materialises;
- maintain or increase conservation funding where needed so that the background state of biodiversity is not compromised;
- facilitate the conservation funded by credits being truly additional;
- recognise that the role of voluntary biodiversity credit markets is potentially small, and that these markets will often depend on either direct or indirect government resourcing;
- consider the introduction or expansion of complementary measures to support those actions/activities that do not 'fit' in a voluntary biodiversity credit market.

Focus area 2: Procurement and maintenance of underlying spatial and ecological data to support quality decision making for those participating in voluntary biodiversity credit markets

Voluntary biodiversity credit markets will build on the existing base of indigenous biodiversity in an area, and the data and expertise gained from previous (usually public) investments in conservation. This includes, but is not limited to, underlying data and evidence, fundamental information on species, ecosystems and restoration methods, and established species and ecosystem recovery programmes as models. Public investment could usefully be focused on establishing and maintaining the data collection systems and research and monitoring that would be needed to underpin high-quality decision making for markets and other conservation investment mechanisms. Such investment would also rely on support for the underlying science system that produces and retains the expertise necessary to achieve all of the above.

The parliamentary commissioner for the environment has pointed out that biodiversity data is held by multiple entities, including central government agencies, councils, public research organisations (formerly Crown research institutes), universities and private businesses. Datasets have variable availability, accessibility and usability, and are often collected and maintained without standard methodologies and in the absence of reliable technical guidance (Parliamentary Commissioner for the Environment, 2025). One of the benefits of improved and consistent spatial and ecological data is that it will support more robust decision making in voluntary biodiversity credit markets.

Public investment could be targeted towards the following types of initiatives:

- establishing, where necessary, and maintaining underlying ecological datasets across private as well as public land using common methodologies;
- providing a mechanism for project proponents to access this data to guide their investment decisions, and for buyers to gauge the value of credits;
- providing a mechanism for market developers to contribute data and information acquired through market activity into publicly held repositories following standard protocols;
- supporting research into cost-effective methods to restore and maintain biodiversity where few proven options currently exist (especially for higher-value biodiversity);
- supporting the recognition and protection of data sovereignty, including indigenous data sovereignty, in ways that do not allow market activity to compromise it.

As noted earlier, the success of the above initiatives would be reliant on sufficient scientific expertise and resourcing.

Box 3 Examples of areas where state intervention may be necessary

Actors in the market are making false and fraudulent claims that lead to local and wider-scale declines in indigenous biodiversity

Deceptive actions can be lucrative to undertake and expensive to stop, with the evidential threshold usually being quite high. Legal remedies to counter false claims can be brought about by regulatory agencies (e.g., the Commerce Commission) or through the provision of open standing. The latter enables third parties to also uphold market rules and seek legal remedies for breaches by market administrators or participants (MacIntosh et al., 2018). Ensuring legal remedies are fit for purpose provides an important backstop to market-based integrity settings. Where third parties may act in respect of these concerns, provisions like immunity from costs can support greater public interest outcomes.

There is misuse of the voluntary biodiversity credit market

Risks arise where mandatory obligations are orchestrated through voluntary mechanisms. Voluntary biodiversity credit markets are unlikely to operate with the rigorous scaffolding needed to support regulatory obligations. Placing controls on the interplay of voluntary biodiversity credit markets and these obligations limits the opportunity for the misuse of these markets: for example, not allowing voluntary biodiversity credits to be considered as offsets or compensation in regulatory processes.

There is an impact of land alienation on indigenous communities (e.g., restrictions on gathering food/rongoā/fibre resources from land when conservation becomes the over-arching objective)

While there are doubtless opportunities for indigenous communities to undertake their own projects in voluntary biodiversity credit markets, risks may arise where others do the same with effects on indigenous rights and interests. Conservation objectives can conflict with indigenous communities' aspirations for their whenua, and activities designed to generate biodiversity credits must carefully navigate this to avoid unjust outcomes for indigenous people. The requirement for accrual of benefits for indigenous communities is a common feature of biodiversity credit markets globally, but ensuring this occurs in practice can be fraught. Issues may arise where market activity cuts across obligations, including within Treaty of Waitangi settlements, where market activities are at odds with indigenous aspirations or where land of significance to indigenous communities (but not within their possession) is modified to meet market objectives. Depending on the circumstances, the government may be in a position to intervene in a way market administrators are not willing or able to.

Focus area 3: Promulgation and use of mechanisms to manage the risk of bad actors and fraudulent claims in voluntary biodiversity credit markets

Some voluntary biodiversity credit markets may have mechanisms to address fraud, but these are unlikely to match the potential of the state for both deterrence and sanction. Because integrity in voluntary biodiversity credit markets is especially difficult to demonstrate and sustain (see Box 1), there is a significant risk that opportunists will identify weak checks and balances as opportunities to derive commercial gain. Governments have powers that can be used to control the direct and indirect impacts

of bad actors and dubious transactions that other participants or observers will not have (e.g., anti-corruption mechanisms). Government action is needed especially where the implications of adverse behaviour spill outside the market and can harm public goods and vulnerable communities.

Market administrators are not usually regulators and are unlikely to have the regulatory or moral authority to successfully remove all bad actors. In some instances, it could be in the interests of market administrators to ignore or accept suspect claims to maintain market activity. Even where specific assurance and verification pathways are in place, incentives exist to limit their impact at place (Giles & Coglianese, 2025). Examples of issues in which the state may be best placed to intervene are set out in Box 3.

Legal remedies would need to be adequately resourced, supported by appropriate monitoring and surveillance strategies, and undertaken at sufficient scale and frequency to achieve both specific and general deterrence. The effectiveness of those strategies and interventions would need to be monitored and evaluated during general regulatory stewardship activities for all government agencies.

Summary and ways forward

Voluntary biodiversity credit markets are perceived to operate independently of governments, but their effects on public goods and on the rule of law can be significant (even if the market is small or unsuccessful). Therefore, we suggest that public investment in and around biodiversity credit markets requires careful consideration. While public spending on experimentation, knowledge exchange and promotion of the concept of biodiversity credits may be legitimate, governments also have broader responsibilities to manage the system-level consequences where they are adverse for biodiversity and communities.

Those two, somewhat competing, roles need strategic balancing to ensure that the wider public interest in a healthy environment is not compromised by an imbalance in public investment that promotes the concept of a biodiversity credit market without adequately safeguarding against its well-understood risks. In this article we have presented some suggestions for what governments might prioritise in relation to these markets. We consider that key aspects of a government's role are in ensuring that public investment is maintained, that the underlying evidence base for transactions is substantial and functional, and that legal remedies through which bad actors can be swiftly identified and excised from the market are provided and resourced.

1 Voluntary nature markets are a specific subset of 'environmental markets' or 'nature markets' which trade biodiversity credits on a voluntary basis. Carbon markets are also considered voluntary nature markets in New Zealand.

References

Biodiversity Credit Alliance. (2024). *Definition of a biodiversity credit*. Issue Paper No. 3. https://www.biodiversitycreditalliance.org/wp-content/uploads/2024/05/Definition-of-a-Biodiversity-Credit-Rev-220524.pdf

Biodiversity Credit Alliance. (2025). *The potential role of governments in biodiversity credit markets*. Knowledge Brief. https://www.biodiversitycreditalliance.org/wp-content/uploads/2025/12/BCA_Knowledge-Brief_2_Governments_in_Biodiversity_Credit_Markets.pdf

Brown, M. A., Stephens, R. T. T., Peart, R., & Fedder, B. (2015). *Vanishing nature: facing New Zealand's biodiversity crisis*. Environmental Defence Society. https://eds.org.nz/resources/documents/reports/vanishing-nature-facing-new-zealands-biodiversity-crisis/

Dempsey, J. (2025). Bake sales to save nature: Why Wall Street conservation survives. *Development and Change*, 57(1), 3–26. https://onlinelibrary.wiley.com/doi/full/10.1111/dech.70035

Department of Conservation. (2026). *Action for nature: Implementation plan for Te Mana o te Taiao Aotearoa New Zealand Biodiversity Strategy 2020*. Department of Conservation.

Doole, M. (2024). *Empowering action: Improving the funding and support for community conservation in Aotearoa*. Report for the Predator Free New Zealand Trust. https://predatorfreenz.org/wp-content/uploads/2024/07/Mataki_PFNZ_Empowering_Action_Report.pdf

Giles, C., & Coglianese, C. (2025). Auditors can't save carbon offsets. Science, 389(6756), 107.

Greenhalgh, S., Walker, S., Simcock, R., & Doole, M. (2026). *Eight guardrails for voluntary biodiversity credit markets which work for nature and people*. Bioeconomy Science Institute Policy Brief 36. https://www.landcareresearch.co.nz/assets/Publications/Policy-Briefing-Guidance-Papers/Policy-Brief-36_Guardrails_voluntary-Biod-Markets.pdf

Kedward, K., zu Ermgassen, S. O., Ryan-Collins, J., & Wunder, S. (2022). *Nature as an asset class or public good? The economic case for increased public investment to achieve biodiversity targets*. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4306836

Kedward, K., zu Ermgassen, S. O., Ryan-Collins, J., & Wunder, S. (2023). Heavy reliance on private finance alone will not deliver conservation goals. *Nature Ecology & Evolution*, 7(9), 1339–1342.

Macintosh, A., Gibbons, P., Jones, J., Constable, A., & Wilkinson, D. (2018). Delays, stoppages and appeals: An empirical evaluation of the adverse impacts of environmental citizen suits in the New South Wales land and environment court. *Environmental Impact Assessment Review*, 69, 94–103.

Ministry for the Environment. (2025) *Scaling up voluntary nature credits market activity in New Zealand: Proposed government roles*. Ministry for the Environment. Scaling-Up-Voluntary-Nature-Credits-Market-Activity-in-New-Zealand-Proposed-Government-Roles.pdf

Ministry for the Environment & Statistics New Zealand. (2025). *Our environment 2025: Tō tātou taiao*. https://environment.govt.nz/assets/publications/our-environment-2025.pdf

Parliamentary Commissioner for the Environment. (2025). *Estimate of environmental expenditure 2025/26: Methods and results*. Parliamentary Commissioner for the Environment. https://pce.parliament.nz/media/gdxlv45i/estimate-of-environmental-expenditure-2025-26-method-and-results.pdf

Swinfield, T., Shrikanth, S., Bull, J. W., Madhavapeddy, A., & zu Ermgassen, S. O. (2024). Nature-based credit markets at a crossroads. *Nature Sustainability*, 7(10), 1217–1220.

UNEP. (2025). *A future we choose: Why investing in Earth now can lead to a trillion-dollar benefit for all*. Global Environment Outlook 7. United Nations Environment Programme. https://www.unep.org/resources/global-environment-outlook-7

Walker, S., Doole, M., Simcock, R., & Greenhalgh, S. (2025). *Design and delivery of voluntary biodiversity credit markets: eight difficult problems*. Manaaki Whenua Landcare Research Policy Brief 32. https://www.landcareresearch.co.nz/assets/Publications/Policy-Briefing-Guidance-Papers/Policy-Brief-32-Design-and-delivery-of-voluntary-biodiversity-credit-markets-eight-difficult-problems.pdf

World Economic Forum. (2025). *High-level principles to guide the biodiversity credit market*. World Economic Forum. https://www.biodiversitycreditalliance.org/wp-content/uploads/2025/05/377455_High_Level_Principles_to_Guide_the_Biodiversity_Credit_Market_En_v7_May-2025.pdf

Wunder, S., Fraccaroli, C., Bull, J. W., Dutta, T., Eyres, A., Evans, M. C., Thorsen, B. J., Jones, J. P., Maron, M., Muys, B., & Pacheco, A. (2025). Biodiversity credits: An overview of the current state, future opportunities, and potential pitfalls. *Business Strategy and the Environment*, 4, 8470–8499. https://doi.org/10.1002/bse.70018

WWF-New Zealand. (2024). *A nature positive Aotearoa: Economic analysis of Aotearoa New Zealand's nature opportunity*. EY & World Wildlife Fund. https://wwf.org.nz/sites/default/files/2024-11/A%20Nature%20Positive%20Aotearoa.pdf

WWF-New Zealand. (2026, April 23). *Biodiversity plan 'greenwashing' over failure to plug funding gap* [Press release]. https://wwf.org.nz/news/nature-positive/biodiversity-plan-greenwashing-over-failure-plug-funding-gap

Zu Ermgassen, S. O., Devenish, K., Simmons, B. A., Gordon, A., Jones, J. P., Maron, M., Schulte to Bühne, H., Sharma, R., Sonter, L. J., Strange, N., & Ward, M. (2023). Evaluating the impact of biodiversity offsetting on native vegetation. *Global Change Biology*, 29(15), 4397–4411.